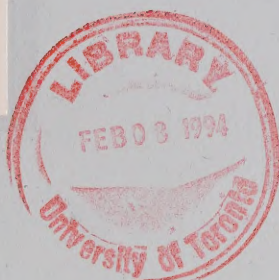


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National Energy Board

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## Reasons For Decision


Interprovincial Pipe Line Inc.

**OH-1-93**

**December 1993**

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**Facilities and Toll Methodology**



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# National Energy Board

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## Reasons for Decision

In the Matter of

## Interprovincial Pipe Line Inc.

Application for Expansion Facilities and Toll  
Methodology dated 24 June 1993, as  
amended 17 September and 11 November  
1993

OH-1-93

December 1993



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## Abbreviations

Act	<i>National Energy Board Act</i>
APMC	Alberta Petroleum Marketing Commission
assessments	environmental and socio-economic assessment reports
Board or NEB	National Energy Board
b/d	barrels per day
B.C.	British Columbia
CAPP	Canadian Association of Petroleum Producers
Cdn \$	Canadian dollars
cm	centimetre
Cochin	Cochin Pipe Lines Ltd.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service (of Environment Canada)
dB(A)	decibels ("A" weighted)
DFO	Department of Fisheries and Oceans (of Canada)
DOE/FE	(U.S.) Department of Energy/Office of Fossil Energy
DRA	drag reducing agent
EARP Guidelines Order	<i>Environmental Assessment and Review Process Guidelines Order</i>
Eight Shippers or Group of Eight	comprised of Amoco Canada Petroleum Company, Gulf Canada Resources Limited, Husky Oil, Imperial Oil Limited, Mobil Oil Canada, PanCanadian Petroleum Limited, Petro-Canada Inc. and Shell Canada Limited
EIL	Environmental Issues List
EPN	Early Publication Notification
ERCB	(Alberta) Energy Resources Conservation Board
Express	Express Pipeline Ltd.
FERC	(U.S.) Federal Energy Regulatory Commission



ha	hectare(s)
IPL or the Applicant	Interprovincial Pipe Line Inc.
km	kilometre(s)
Koch	Koch Oil Company Limited
kp	kilometre post
kPa	kiloPascal
Lakehead or LPL	Lakehead Pipe Line Company Inc.
m	metre(s)
m <sup>3</sup>	cubic metre
m <sup>3</sup> /d	cubic metres per day
mm	millimetre
Murphy/Wascana	Murphy Oil Company Limited/Wascana Pipe Line Ltd.
NGL	Natural Gas Liquids
Novacor	Novacor Chemicals (Canada) Limited
NWT	Northwest Territories
PFRA	Prairie Farm Rehabilitation Administration
Prairies	Alberta, Saskatchewan and Manitoba
proposed expansion	proposed capacity expansion facilities
PPBR	Plans, Profiles and Books of Reference
psig	pounds per square inch (gauge)
SERM	Saskatchewan Department of Environment and Resources Management
Suncor	Suncor Inc.
U.S.	United States of America
\$US	United States dollars
Wascana	Wascana Pipe Line Ltd.
WCSB	Western Canada Sedimentary Basin
WTI	West Texas Intermediate, a light sweet crude oil

## Recital and Appearances

IN THE MATTER OF the *National Energy Board Act* ("the Act") and the Regulations made thereunder; and

AND IN THE MATTER OF an application by Interprovincial Pipe Line Inc. for a Certificate of Public Convenience and Necessity under Part III of the Act authorizing the installation of additional facilities;

AND IN THE MATTER OF an application by Interprovincial Pipe Line Inc. for an Order under Part IV of the Act respecting the toll methodology for the expansion;

AND IN THE MATTER OF the National Energy Board Hearing Order OH-1-93.

HEARD in Calgary, Alberta on 22, 23, 24, 25 and 30 November 1993.

BEFORE:

K.W. Vollman	Presiding Member
R. Priddle	Member
C. Bélanger	Member

APPEARANCES:

J.B. Ballem Q.C.	Interprovincial Pipe Line Inc.
G.D. Baker	
L.G. Schafer	
L. Keough	Canadian Association of Petroleum Producers
N. Gretener	
D.A. Holgate	Amoco Canada Petroleum Company Ltd.
K.S. Archibald	Chevron Canada Resources
R. Graw	Express Pipeline Ltd.
A.S. Hollingworth	Gulf Canada Resources Limited, Husky Oil, Imperial Oil Limited, Mobil Oil Canada, PanCanadian Petroleum Limited, Petro-Canada Inc., and Shell Canada Limited
K.F. Miller	Koch Oil Company Limited
F.R. Foran	Murphy Oil Company Limited and
J.M. Liteplo	Wascana Pipe Line Ltd.
P. Fettig	Novacor Chemicals (Canada) Limited
J.T. Horte	Wascana Energy Inc. (formerly Saskoil)

L.E. Smith

Suncor Inc.

G.A. Irving

Trans Mountain Pipe Line Company Ltd.

W.A. Moreland

Alberta Petroleum Marketing Commission

J. Robitaille

Procureur général du Québec

M.A. Fowke

Board Counsel

I.V. Gendron



## Glossary of Terms

<b>Apportionment</b>	The monthly calculated difference between the total nominated volume and the available pipeline operating capacity.
<b>Barrel</b>	1 barrel is approximately equal to 0.159 m <sup>3</sup>
<b>Bitumen</b>	A naturally occurring viscous mixture consisting mainly of hydrocarbons heavier than pentanes not generally recoverable through a well utilizing conventional recovery methods. Bitumen is typically combined with a diluent to obtain a sufficiently low viscosity to be transported by pipeline.
<b>Blended Heavy Crude Oil</b>	A collective term used to refer to blends of diluent and conventional heavy crude oil or bitumen.
<b>Condensate</b>	A mixture of hydrocarbons comprised mainly of pentanes and heavier hydrocarbons recovered as liquid from field separations, scrubbers or other gathering facilities or at the inlet of a natural gas processing plant before the gas is processed in the plant.
<b>Conventional Light Crude Oil</b>	Crude oil generally having a specific gravity less than 0.904 gm/cc (25° API) which can be produced through a well using normal production practices and without altering the natural viscous state of the oil.
<b>Conventional Heavy Crude Oil</b>	Crude oil generally having a specific gravity greater than 0.904 gm/cc (25° API) which can be produced through a well using normal production practices and without altering the natural viscous state of the oil.
<b>Crude Oil and Equivalent</b>	A collective term used to refer to all grades of crude oil, including conventional light crude oil, synthetic crude oil, pentanes plus, conventional heavy crude oil and bitumen.
<b>Diluent</b>	A light hydrocarbon mixture, usually pentanes plus, blended with conventional heavy crude oil or bitumen to reduce the viscosity to facilitate pipeline transportation.
<b>Diversion Berm</b>	An erosion control technique consisting of shallow earthfilled dikes (typically less than a metre in height and width) which are placed at intervals on a right-of-way slope to collect and direct surface flows so that they are channelled along the right-of-way.

<b>Fee Simple</b>	The maximum possible ownership in real estate.
<b>Impeller and Trims</b>	Internal components of a pump which increase the velocity of the liquid flowing through the pump and are designed to adjust the capability and efficiency of a pump.
<b>Lek</b>	An area where certain bird species assemble to carry on courtship behaviour.
<b>Lloyd Blend</b>	A blend of conventional heavy crude oil from the Lloydminster, Alberta area and diluent.
<b>Natural Gas Liquids (NGL)</b>	A mixture of hydrocarbons recovered from natural gas as liquids. These liquids include, but are not limited to, ethane, propane, butanes, pentanes plus and condensate, and may include small quantities of non-hydrocarbons.
<b>Pentanes Plus</b>	A mixture of hydrocarbons consisting mainly of pentanes and heavier hydrocarbons which is obtained from the processing of natural gas, condensate or crude oil.
<b>Prairie Protector</b>	A specialized adaptation to construction equipment typically used for clean-up purposes, that reduces the amount of disturbance on the existing, and thin, sod layer when returning topsoil to its original location. This equipment is typically used on native prairie pastures when the reduction of the right-of-way width disturbance is desirable.
<b>Ripping</b>	A technique used to mitigate the environmental impact of soil compaction. Compacted soil is loosened using an implement designed with heavy strength shanks. Mixing of the soil layers may occur with this technique; therefore it is usually performed on portions of the right-of-way where topsoil has been stripped and not yet returned.
<b>Scalping</b>	The accidental disturbance or removal of the existing sod layer during the handling of soils.
<b>Scraping</b>	The removal or disturbance of the sod layer during construction activities.
<b>Straw Crimping</b>	A technique used to protect exposed soil from wind erosion. Either cereal or flax straw material is incorporated into the ground surface using a specially designed implement so that the straw produces a micro-environment that acts as a wind break.

**Subsoiler**

An agricultural implement used to break through and shatter compacted subsoil without causing the subsoil to be brought to the surface and mixed with the overlying topsoil layer. This is accomplished using special plates attached to the bottom of the shanks. Subsoilers are effective for relieving compacted subsoils to depths up to 60 cm.

**Synthetic Crude Oil**

A mixture of hydrocarbons, similar to crude oil, derived by upgrading bitumen from oil sands.



## Chapter 1

# Introduction

---

### 1.1 The Application

On 24 June 1993, Interprovincial Pipe Line Inc. ("IPL" or "the Applicant") filed an application with the National Energy Board ("NEB" or "the Board") pursuant to Part III of the *National Energy Board Act* ("the Act") for a Certificate of Public Convenience and Necessity and Part IV of the Act for an order respecting toll methodology. The Applicant sought authorization to construct and operate capacity expansion facilities on its pipeline system in western Canada ("the proposed expansion"). The Environmental and Socio-Economic Assessment and the Early Public Notification Reports were subsequently filed by IPL with the Board in mid-August 1993 to complete the application. On 3 September 1993, the Board issued Hearing Order OH-1-93 setting out Directions on Procedure for the public hearing to be conducted into the proposed expansion.

IPL filed a general revision to its application under a covering letter dated 17 September 1993 increasing the capacity to be added as a result of its proposed expansion from 17 500 m<sup>3</sup>/d (110,000 b/d) to 19 900 m<sup>3</sup>/d (125,000 b/d).

IPL filed a second amendment to its application under a covering letter dated 11 November 1993 which, as a result of major changes to its proposed expansion, increased the additional capacity to 27 100 m<sup>3</sup>/d (170,000 b/d) at a total cost of \$256 million.<sup>1</sup> This amendment was developed by IPL in response to representations from a group of shippers.<sup>2</sup>

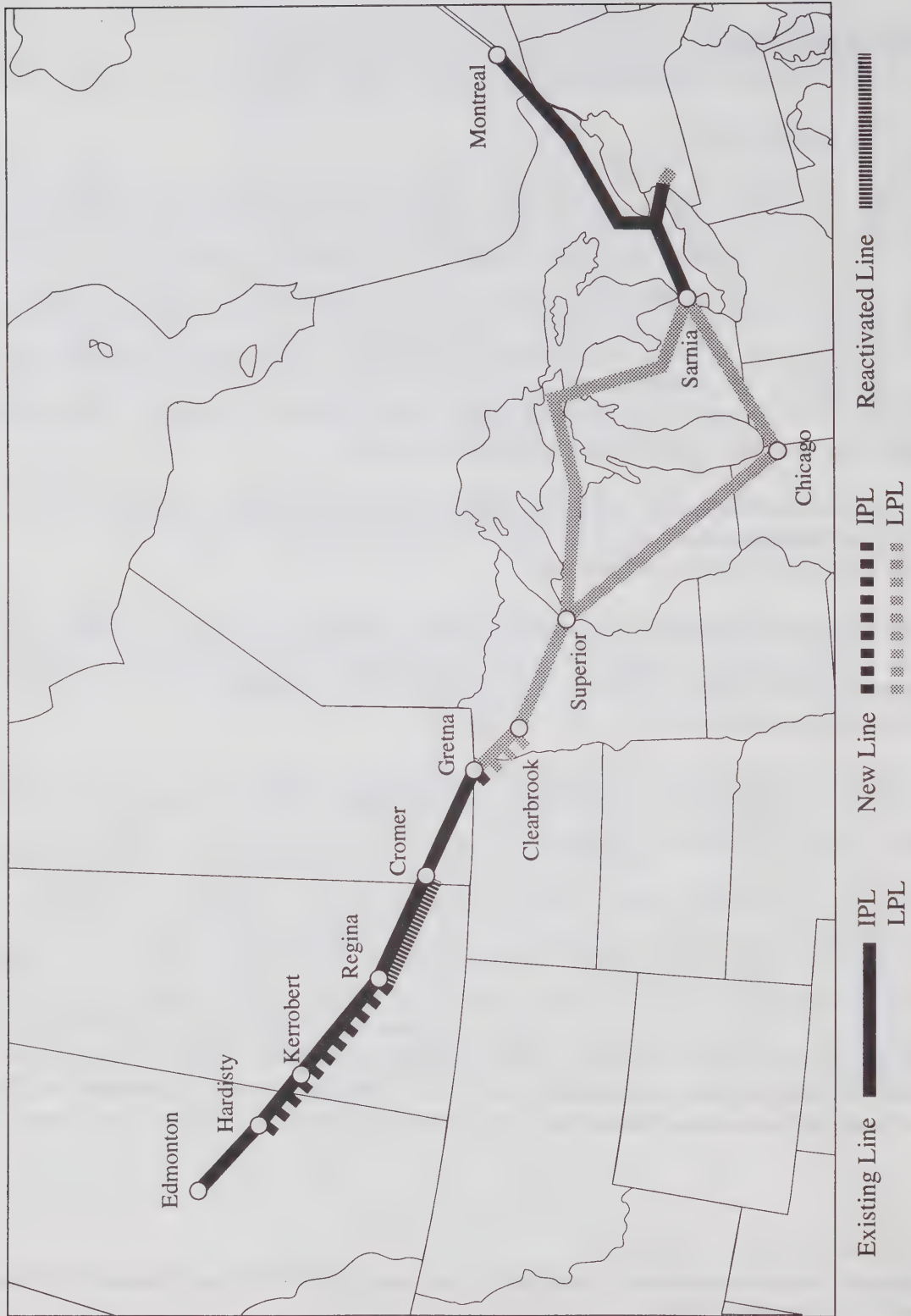
IPL operates a pipeline system which extends from Edmonton, Alberta to the international border just south of Gretna, Manitoba (Western Division) and from Sarnia, Ontario to Montréal, Québec (Eastern Division). IPL's two divisions are linked via the pipeline system operated by Lakehead Pipe Line Company Inc. ("Lakehead" or "LPL") in the United States of America ("U.S."). A diagram of the combined IPL and Lakehead pipeline systems is shown in Figure 1-1. The IPL and Lakehead systems operate jointly in a batch mode to minimize the amount of contamination of different types of crude oils and products shipped on the system. The IPL system currently consists of three lines to transport light, medium and heavy crude oil, synthetic crude oil, condensate, refined products and natural gas liquids ("NGL"). These lines require a number of stations and terminals to provide pumping capacity to maintain pipeline pressure and storage tanks for receipt and delivery of crude oil and refined products. IPL also has break-out tankage at some of its terminals to allow it to arrange the different types of crude oil and product batches that it transports to optimize the capacity of the system.

---

<sup>1</sup> In anticipation of the filing of the revised application, the Board issued AO-2-OH-1-93 on 5 November 1993 to make changes to the pre-hearing schedule.

<sup>2</sup> "The Group of Eight" or "the Eight Shippers" comprised of Amoco Canada Petroleum Company, Gulf Canada Resources Limited, Husky Oil, Imperial Oil Limited, Mobil Oil Canada, PanCanadian Petroleum Limited, Petro-Canada Inc. and Shell Canada Limited. Together they represent 55 percent of the total light crude production in Canada.

Figure 1-1  
Western Canadian Pipeline Expansion



The expansion facilities are scheduled to be in service by 31 December 1994. Details of the expansion facilities are set out in Chapter 4 of these Reasons for Decision. The configuration of the expanded system would provide a fourth line (Line 13) from Hardisty, Alberta to Clearbrook, Minnesota. This fourth line would be utilized for light sweet crude oil service. The IPL expansion would coincide with an expansion of the Lakehead system.

In its application, IPL proposed a rolled-in toll design treatment for the proposed expansion facilities. The cost of the expansion would therefore be included in the IPL general system rate base and recovered through tolls paid by all shippers.

## **1.2 Facilities Application by Express**

On 3 October 1993, Express Pipeline Ltd. ("Express"), a wholly owned subsidiary of Alberta Energy Company Ltd., filed an application with the Board pursuant to Parts III and IV of the Act. The proposed Express pipeline was to connect to the IPL system at Hardisty, Alberta and provide western Canadian crude oil producers with access to markets in the Petroleum Administration of Defense District ("PADD") IV in the U.S. and to other existing pipelines at a pipeline hub located near Casper, Wyoming for delivery to the Wood River market area in PADD II.

The Board issued an Amending Order AO-1-OH-1-93 on 8 October 1993 for a combined hearing of IPL's proposed expansion and Express' proposed pipeline. However, by letter dated 15 November 1993, Express withdrew its application.

## **1.3 Environmental Reviews**

During the OH-1-93 proceeding, the environmental and directly related social effects of the project were considered concurrently under two separate processes:

- (i) an environmental screening of the application pursuant to the *Environmental Assessment and Review Process Guidelines Order* ("the EARP Guidelines Order"); and
- (ii) a project review pursuant to the Board's mandate under Part III of the Act.

The Board conducted an environmental screening of the applied-for facilities in compliance with the EARP Guidelines Order insofar as there was no duplication with the Board's own regulatory process. The Board has determined that the potentially adverse environmental effects that may be caused by the applied-for facilities and the social effects directly related to those environmental effects are insignificant or mitigable with known technology. This conclusion, outlined in a separate screening document, represents a finding pursuant to paragraph 12(c) of the EARP Guidelines Order.

The Board's views formed pursuant to Part III of the Act in respect of the environmental effects and socio-economic effects of the applied-for facilities are set out in Chapter 6 of these Reasons for Decision.



## Chapter 2

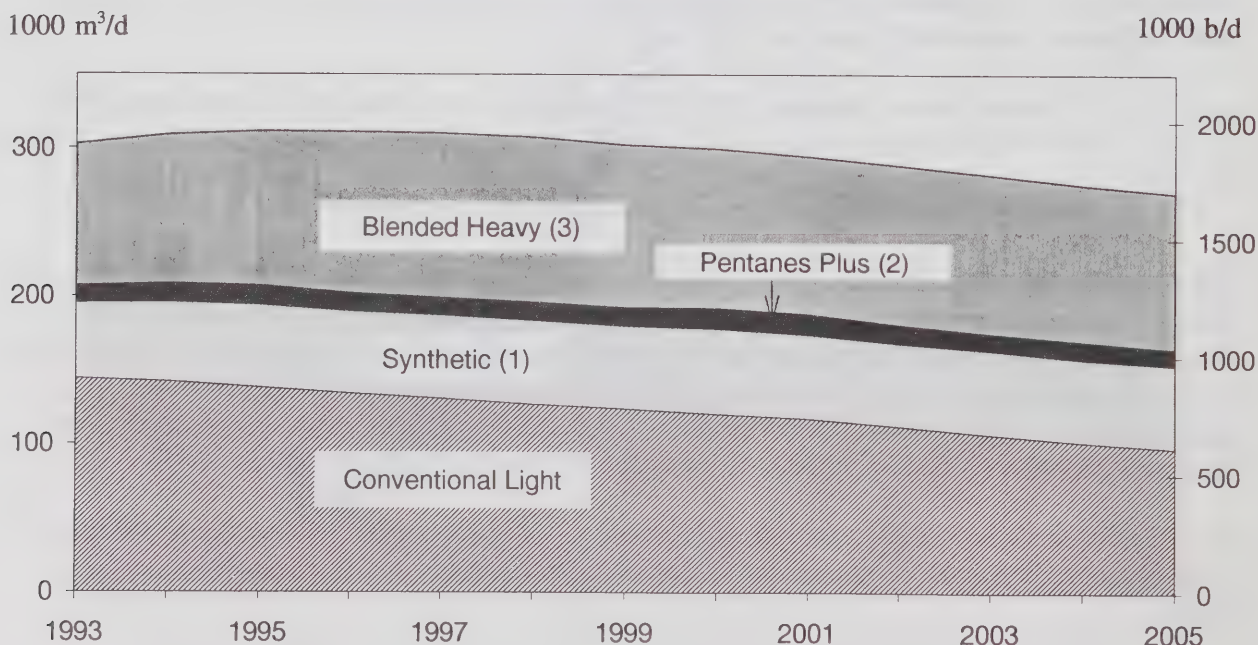
# Supply

### 2.1 Supply Of Crude Oil and Equivalent

In support of its application, IPL provided a forecast of production of western Canadian crude oil to the year 2005. This forecast had been developed from responses to an industry survey conducted in the fall of 1992 and further updated through industry consultations throughout 1993. Respondents to the survey were requested by IPL to base their projections on a reference West Texas Intermediate ("WTI") price at Cushing, Oklahoma that increases from \$US 20.49 per barrel in 1993 to \$US 23.52 in 2005 in 1992 constant dollars. Respondents were also requested to base their responses on a light/heavy crude oil price differential between WTI and Lloyd Blend at Chicago of \$US 6.00 per barrel.

IPL forecasted that total production of crude oil and equivalent in western Canada would average 302 600 m<sup>3</sup>/d (1,903,000 b/d) in 1993, would increase to 311 600 m<sup>3</sup>/d (1,960,000 b/d) by 1995 and then decline through the remainder of the forecast period averaging 270 200 m<sup>3</sup>/d (1,699,000 b/d) in 2005 (see Figure 2-1). IPL also stated in its application that it considered its forecast of light crude oil production to be conservative given that previous forecasts had consistently underestimated the future supply.

**Figure 2-1**  
**Forecast of Western Canadian Crude Oil Production**



1. Includes synthetic crude oil produced at heavy crude oil upgraders and mining plants.
2. Includes volume of pentanes plus produced directly with light crude oil and excludes pentanes plus used for diluent.
3. Includes diluent and upgrader feedstock.

In response to an information request by the Procureur général du Québec ("Government of Québec") and cross-examination by Board counsel, IPL stated that it had not received sufficient information in its survey of producers to forecast crude oil production at lower or higher prices than those on which its forecast was based. IPL stated that it did not believe that supply was overly sensitive to price in the range of plus or minus two dollars per barrel.

None of the intervenors challenged IPL's forecast of western Canadian crude oil production. The Canadian Association of Petroleum Producers ("CAPP") provided its own forecast of crude oil production which, with an appropriate adjustment to include synthetic crude oil from regional upgraders and recycled diluent, was almost the same in total as the forecast provided by IPL. CAPP believed that its forecast of crude oil production was conservative.

The CAPP forecast of western Canadian crude oil production, with a small reduction in the volumes of bitumen amounting to 800 to 1 600 m<sup>3</sup>/d (5,000 to 10,000 b/d) during the years 1995 to 2002, was adopted by the Eight Shippers.

## **2.2 Supply of Natural Gas Liquids**

In its application, IPL did not provide a forecast of the western Canadian supply of NGL, although it forecasted an increase in throughput of NGL on its system from 20 700 m<sup>3</sup>/d (130,000 b/d) in 1995 to 23 200 m<sup>3</sup>/d (146,000 b/d) in 2005. Over and above the volumes included in its throughput forecast, IPL stated that an additional supply amounting to 7 200 m<sup>3</sup>/d (45,300 b/d) had also been identified. In response to questions by the Alberta Petroleum Marketing Commission ("APMC"), IPL stated that this additional supply would come from increased natural gas production and recovery from miscible flood projects.

The Eight Shippers provided a forecast of deliveries of NGL on the IPL system. This forecast was identical to IPL's, showing an increase of NGL from 20 700 m<sup>3</sup>/d (130,000 b/d) in 1995 to 23 200 m<sup>3</sup>/d (146,000 b/d) in 2005.

None of the intervenors challenged IPL's forecast of NGL throughput on its system.

In response to a request by the Board, IPL also provided supply forecasts for propane and butane from western Canadian natural gas production, prepared by Purvin & Gertz Inc. and Marengo Consulting Ltd. Those forecasts, when averaged, showed an overall increase in the supply of the propane and butane components of NGL, from a level of approximately 37 000 m<sup>3</sup>/d (233,000 b/d) in 1993 to a level of 43 000 m<sup>3</sup>/d (270,000 b/d) in 2005.

### ***Views of the Board***

The Board recognizes the uncertainties associated with forecasts of the supply of crude oil and other commodities shipped on the IPL system. However, it accepts as reasonable the forecasts of supply of crude oil and NGL submitted by IPL.

## Chapter 3

# Markets

---

### 3.1 Demand for Western Canadian Crude Oil and Equivalent

IPL based its forecast disposition on the results obtained from a survey of all refineries in Canada and the United States capable of receiving western Canadian crude oil. The survey was conducted in the fall of 1992 and was further updated through industry consultations during 1993. It covered the period from 1993 to 2005.

IPL used the following assumptions in developing its forecast:

- 1) Demand in non-IPL markets, namely British Columbia, Alberta, the Northwest Territories, and Saskatchewan, and exports to Montana and North Dakota and to the State of Washington will be satisfied prior to determining deliveries through the IPL system;
- 2) Ontario refinery demand will be satisfied by western Canadian crude oil production prior to the reversal of the Sarnia to Montréal pipeline ("Line 9");
- 3) The Sarnia to Montréal pipeline will be reversed on 1 January 1999 based on IPL's supply and demand projections. Based on forecasted deliveries after reversal provided by IPL, Ontario refinery demand will be met as follows:

**Table 3-1**  
**Forecast of Crude Oil Supply for Ontario Refineries**  
**after Line 9 Reversal**  
**(10<sup>3</sup>m<sup>3</sup>/d)**

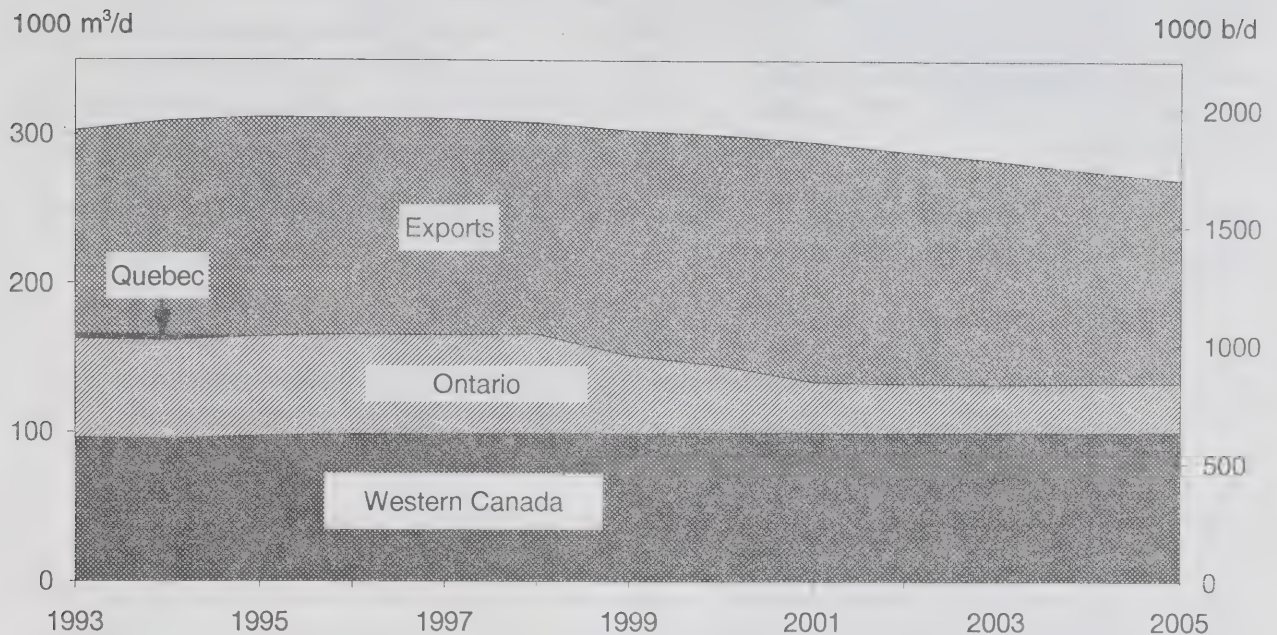
	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>
<b>Imports</b>	14.8	21.8	33.0	34.7
<b>Domestic</b>	<u>73.7</u>	<u>66.0</u>	<u>55.9</u>	<u>54.7</u>
	<b>88.5</b>	<b>87.8</b>	<b>88.9</b>	<b>89.4</b>

- 4) Following reversal of Line 9, the balance of western Canadian crude oil previously delivered to Ontario will be delivered to PADD II; and
- 5) Prior to reversal of the Sarnia to Montréal pipeline, Ontario and PADD I refineries demand will be met prior to PADD II, given that refineries in PADD II have the most alternatives available to obtain supply.

Figure 3-1, illustrates IPL's forecast of western Canadian crude oil disposition.



**Figure 3-1**  
**Forecast of Western Canadian Crude Oil Disposition**



### 3.2 Western Canadian Crude Oil Available to IPL

Based on the assumptions listed in section 3.1, the production available to IPL is calculated as the difference between western Canadian crude oil production and non-IPL western Canadian crude oil disposition. IPL forecasts that the production of crude oil available to its system will average 191 100 m³/d (1,201,800 b/d) throughout the forecast period, which is approximately 65 percent of total western Canadian crude oil production. A summary of production available to IPL is set out in Table 3-2.

**Table 3-2**  
**Forecast of Western Canadian Crude Oil Production Available to IPL**  
**(10³m³/d)**

	<u>1993</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
<b>Forecast Production</b>	302.6	311.6	300.0	270.2
<b>Less Non-IPL Demand:</b>				
British Columbia	19.4	14.5	14.5	14.5
Alberta & NWT	51.1	54.2	54.3	54.3
Saskatchewan	15.9	18.2	19.6	19.7
Exports				
- Washington	3.2	3.2	2.8	1.6
- Montana	14.4	14.2	14.2	14.2
- North Dakota	<u>1.6</u>	<u>1.6</u>	<u>1.6</u>	<u>1.6</u>
<b>Total Non-IPL Demand</b>	<b>105.6</b>	<b>105.9</b>	<b>107.0</b>	<b>105.9</b>
<b>Net Production Available to IPL</b>	<b>197.0</b>	<b>205.7</b>	<b>193.0</b>	<b>164.3</b>

The current annual capacity of the IPL system exiting Kerrobert, Saskatchewan is 194 500 m<sup>3</sup>/d (1,223,200 b/d). Since the late 1980s, Kerrobert has been the capacity constraint or bottleneck point on IPL. Based on the supply available to IPL, without the applied-for expansion, the system is expected to be capacity constrained on an annual basis from 1993 to 2001 and periodically thereafter due to seasonal and demand fluctuations. The capacity shortfall will average almost 22 000 m<sup>3</sup>/d (138,000 b/d) from 1993 to 1998, peaking at 25 100 m<sup>3</sup>/d (158,000 b/d) in 1996 and is then expected to decline slowly.

IPL stated that if the expansion facilities are approved, the capacity of its system will be sufficient to meet the forecasted throughput requirements.

### *Views of the Board*

The Board accepts IPL's approach to determining the quantity of crude oil which will be available to its system in the future. The Board notes that these volumes exceed IPL's current capacity through to the year 2001.

## **3.3 Markets for Incremental Crude Oil and NGL Sales**

Figure 3-2 is presented to indicate the PADDs which are commonly used to define the various U.S. crude oil market areas. This figure also shows the major crude oil pipelines relevant to this hearing.

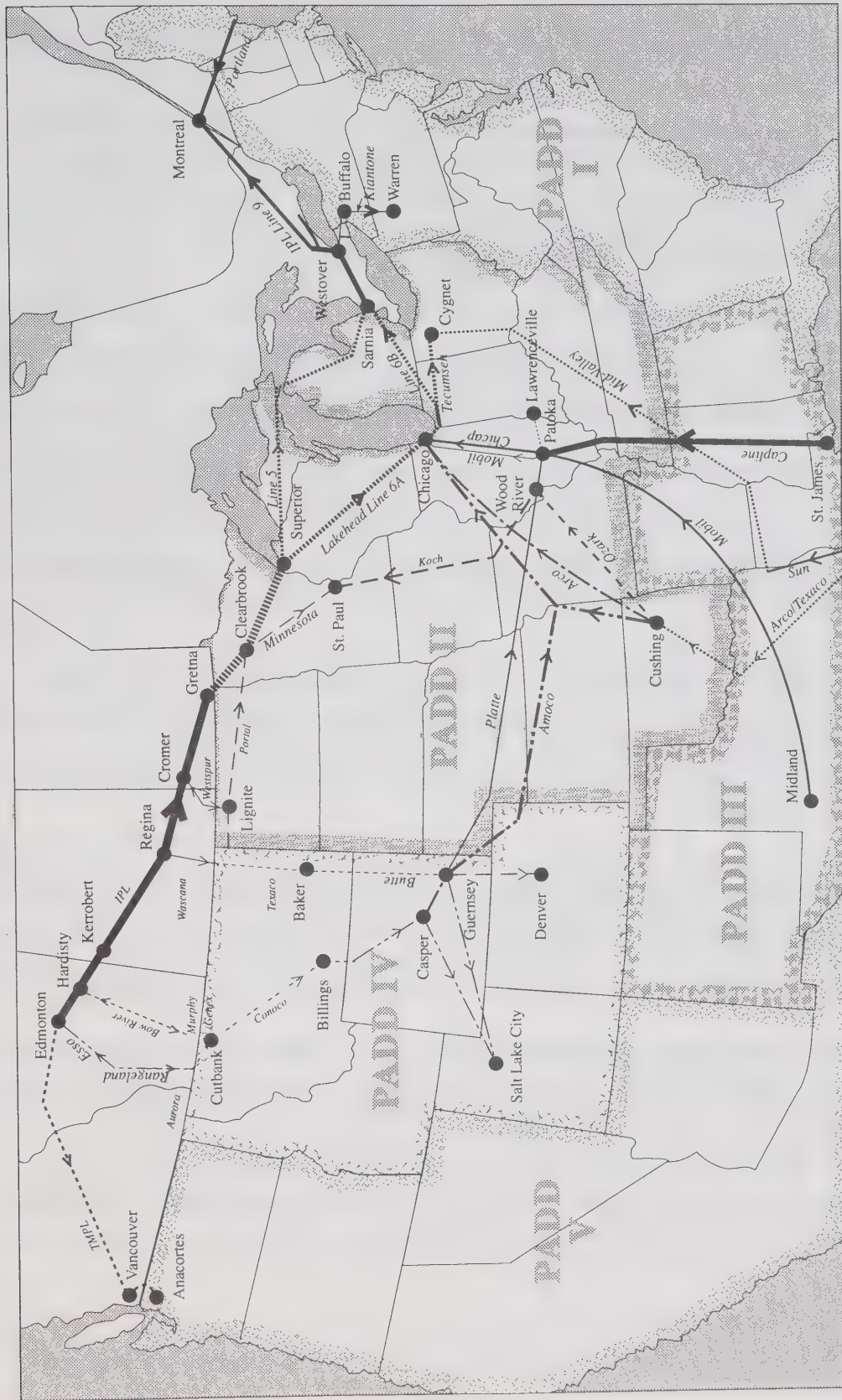
Without the proposed facilities, IPL forecasted total deliveries on its system to be 229 500 m<sup>3</sup>/d (1,443,000 b/d) in 1995, rising to 262 000 m<sup>3</sup>/d (1,648,000 b/d) in 2001, and declining thereafter. This increase reflects the imports of crude oil which are forecasted to be delivered to Ontario refineries on a reversed Sarnia to Montréal pipeline. The volumes of western Canadian crude oil delivered to Ontario prior to reversal of Line 9 would be subsequently displaced and delivered to PADD II. With the proposed facilities, IPL forecasts total deliveries on its system to average 252 000 m<sup>3</sup>/d (1,585,000 b/d) in 1995, increasing to 267 800 m<sup>3</sup>/d (1,684,000 b/d) in 2001, and to decline thereafter.

Deliveries to markets in western Canada served by IPL would not differ greatly under either scenario as IPL assumes that this market would be served prior to markets downstream of the prairies. Deliveries are expected to increase in the early years of the forecast period as more condensate is required for heavy crude oil and bitumen blending, and then to decline slightly to 2005 as the production of conventional heavy crude oil declines. Refined product deliveries are projected to remain relatively stable at an average of 14 700 m<sup>3</sup>/d (92,000 b/d) throughout the period.

IPL stated that the best netback market for producers is the currently connected PADD II market. The Chicago market netback is expected to remain at least \$4.00 per cubic metre (\$0.64 per barrel) higher than deliveries to the Guernsey market. Guernsey is the marketing hub for crude oil in PADD IV. The report of Arthur D. Little, Inc. entitled "Expansion Options for Canadian Crude Oil Pipelines", submitted by IPL as part of its application, confirmed that the preferred market for Canadian crude oil is in the Chicago area. The report concluded that this will continue to be the case in the future. The proposed facilities would result in 1995 deliveries to PADD II rising by 19 400 m<sup>3</sup>/d (122,000 b/d) to 119 400 m<sup>3</sup>/d (751,000 b/d) as compared to IPL's system without an expansion. This increase represents 8 900 m<sup>3</sup>/d (56,000 b/d) of light crude oil and 10 500 m<sup>3</sup>/d (66,000 b/d) of heavy crude oil.



**Figure 3-2**  
**Crude Oil Pipelines Relevant to OH-1-93 Proceeding**



*Note: width of lines is proportional to pipeline capacity*



The proposed facilities will also deliver an additional 3 100 m<sup>3</sup>/d (19,000 b/d) of NGL to Sarnia from western Canada.

IPL stated that exports of Canadian crude oil in 1992 to PADD II represented almost 75 percent (100 000 m<sup>3</sup>/d or 629,000 b/d) of the total volume exported (134 000 m<sup>3</sup>/d or 843,000 b/d). The remaining exports, according to IPL, were primarily to Montana, United Refining in Pennsylvania, and refineries in the U.S. Pacific Northwest. For comparison, imports of crude oil from other foreign sources into PADD II amounted to 89 000 m<sup>3</sup>/d (556,000 b/d).

According to IPL, U.S. market needs for Canadian crude oil will continue to grow because of the forecasted decline in U.S. crude oil production, and the availability of pipeline capacity to transport foreign crude oil from the U.S. Gulf Coast to PADD II. IPL stated that total refinery capacity in PADD II with access to IPL is almost five times greater than the capacity of refineries that have access to Canadian crude oil in PADD IV. PADD IV refineries range in size from 1 100 m<sup>3</sup>/d (7,000 b/d) to 8 600 m<sup>3</sup>/d (54,000 b/d) compared to those in PADD II which range from 5 200 m<sup>3</sup>/d (33,000 b/d) to 58 700 m<sup>3</sup>/d (369,000 b/d). In addition, the viability of PADD IV refiners may be affected in the future by a decline in crude oil production in that area and the economic impact of complying with changes in environmental legislation. IPL also noted that Diamond Shamrock is currently building a petroleum products line from the U.S. Gulf Coast to PADD IV.

CAPP agreed that the markets accessed by IPL provide western Canadian producers with the most attractive netbacks. It anticipated that this relationship would prevail into the foreseeable future, and that western Canadian crude oil would continue to be shipped to Ontario and Québec and PADD II markets via the IPL system. CAPP stated that forecasts indicated that available supply would exceed pipeline capacity to preferred markets resulting in crude oil either being sold in less attractive markets at reduced prices or shut-in.

The Eight Shippers stated that the Northern Tier/Great Lakes market served by IPL which includes the northern part of PADD II, particularly Chicago, yields the best netbacks for incremental volumes of Canadian crude oil. Koch Oil Company Limited ("Koch") stated that the expansion is required to enable incremental deliveries to be made into the PADD II market. The APMC suggested that the proposed expansion would provide Alberta producers with maximum market flexibility.

Murphy Oil Company Limited and Wascana Pipe Line Ltd. ("Wascana") pointed out that the proposed IPL expansion, together with an expansion of the Wascana, Texaco and Butte pipelines system<sup>1</sup> would allow Canadian producers to take advantage of growth opportunities in PADD IV.

Suncor Inc. ("Suncor") indicated that the expansion would allow its Sarnia, Ontario refinery to receive sufficient supply of western Canadian crude oil, and it would also ensure that its synthetic and conventional crude oil production would not be shut-in or forced into less attractive markets.

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<sup>1</sup> Texaco Pipeline Inc. ("Texaco") and Butte Pipe Line Company ("Butte") connect with Wascana's pipeline providing access to PADD IV.

The Government of Québec supported the project. However, it questioned whether the PADD II market would be able to absorb the additional Canadian supply. The provinces of Manitoba and Saskatchewan, as indicated in letters of comment, also supported the expansion in that unrestricted market access would assist producers.

### ***Views of the Board***

The Board is of the view that the proposed increase in capacity on IPL's system would enable Ontario refineries to receive sufficient supplies of western Canadian crude oil at the same time as allowing increased exports to PADD II.

The Board also notes that the largest market for Canadian crude oil is PADD II. Refineries in this market area with access to IPL have approximately 220 000 m<sup>3</sup>/d (1,384,000 b/d) of capacity. In addition, the Board notes that exports of Canadian crude oil to PADD II have grown recently because of declining crude oil production in the United States, and a shortfall in pipeline capacity to transport additional foreign crude oil from the U.S. Gulf Coast to PADD II.

The Board is of the view that the PADD II market can absorb those volumes of western Canadian crude oil currently available to IPL and which are in excess of its current capacity.

The Board is of the opinion that PADD IV refineries will continue to process western Canadian crude oil. However, growth in this market will likely only balance the decline in local U.S. production. The Board also notes that PADD IV will, in the near future, have access to products from the U.S. Gulf Coast.

## **3.4 Benefits of the IPL Expansion**

IPL submitted that its pipeline expansion project would provide two major benefits to the producing sector. The first would be the ability to produce crude oil that would otherwise be shut-in. Measured over a 10-year period, IPL calculated that the producer revenue realized from this source, net of the cost of the facilities, would total \$3.2 billion on a present-value basis.

The second major benefit identified by IPL would be a reduction in pricing discounts to which Canadian crude oil deliveries are subject in the Chicago market. IPL stated that refiners in the Chicago area discount Canadian production in part due to the lack of reliability of Canadian crude oil deliveries as a result of apportionment. According to IPL, the proposed expansion would eliminate apportionment, thereby removing the source of some of the discounts currently experienced by Canadian producers in the Chicago market. IPL suggested that the discounts caused by apportionment range from \$0.25 to \$1.00 per barrel, and that their elimination would provide the producing sector with additional revenues of between \$0.6 billion and \$3.4 billion in present-value terms.

IPL stated that, in addition to these two major benefits, the proposed expansion facilities would provide increased operational flexibility for the IPL system which would benefit both current and future shippers.

The Eight Shippers stated that the proposed expansion would remove capacity constraints on the IPL system which in turn would eliminate shut-in western Canadian crude oil production, diversions to lower value markets, and loss of competitiveness in PADD II markets for Canadian crude oil due to apportionment. The Eight Shippers estimated that these combined benefits would total \$1.8 billion on a present-value basis.

Suncor suggested that the benefits as estimated by IPL may be overstated because the additional Canadian crude oil volumes transported to PADD II via the expanded facilities may depress prices by exacerbating excess supply in this market. A similar argument was made by Novacor Chemicals Canada Limited ("Novacor"). The Government of Québec submitted that if Chicago refiners were unable to readily absorb all of the additional Canadian crude oil deliveries, price discounting and diversions of Canadian crude oil to less attractive markets would result.

Novacor also submitted that the size of benefits would be smaller than suggested by IPL if a cost/benefit analysis on a national basis were performed. In Novacor's view, IPL's analysis merely showed incremental revenues accruing to the producing sector as opposed to a net benefit accruing to Canada. Novacor pointed out that, although a reduction in discounts would result in higher netbacks to Canadian producers, it would also lead to higher prices to Canadian refineries. To this extent, the net benefit on a national basis would be less than suggested by IPL's calculations.

### *Views of the Board*

The Board is of the view that the likely benefits of the expanded facilities would include:

- production of crude oil that would otherwise be shut-in due to pipeline capacity constraints;
- an improvement in the competitive position of Canadian crude oil deliveries in the PADD II market as a result of increased reliability of these deliveries; and
- a reduction in the volumes of western Canadian crude oil which are currently sold in less attractive markets.

Therefore, crude oil would be produced earlier and at better prices than if the expansion did not take place.

While the exact amount of net benefits of the project may be subject to debate, the Board is of the view that the benefits would be sufficient to justify the proposed expansion from a national perspective. The Board recognizes certain supply and market risks that may significantly reduce the indicated net economic benefits. For example, if world oil prices were to be significantly below those forecasted by IPL for an extended period of time, negatively impacting western Canada's future oil supplies, the expansion might not yield the economic benefits projected. Nevertheless, the Board is of the view that the net benefits are likely to be sufficient under most scenarios.



Novacor's position that IPL has overestimated the benefits has some validity. Technically, as pointed out by Novacor, a portion of the increased producer revenues as calculated by IPL represents an income transfer between Canadian consumers and producers. But the pre-expansion situation, where there is insufficient pipeline capacity and resulting discounted prices, could be considered as "abnormal", and the expansion would rectify this situation. Moreover, this consideration does not change the Board's overall conclusion that the net benefits of the additional facilities are likely to be positive.

The Board has considered the arguments put forward by Suncor, Novacor and the Government of Québec that additional Canadian deliveries to PADD II could create excess supply and put downward pressure on prices in that market. The Board is of the view that should this effect materialize, it would likely be small and transitory given the longer term outlook for declining U.S. domestic supplies and higher cost transportation routes required to bring overseas crude to PADD II refineries.

Based on the evidence presented in the hearing, the Board concludes that the benefits of the IPL expansion are likely to be sufficient to justify the construction of the proposed facilities.

## Chapter 4

# Facilities

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### 4.1 Design

IPL's Western Division has a current annual capacity exiting Kerrobert, Saskatchewan of 194 500 m<sup>3</sup>/d (1,223,000 b/d). IPL indicated that a capacity constraint or bottleneck currently exists on its system at that point. Furthermore, based on forecasts of crude oil and equivalent throughput provided by IPL, its current Western Division system will be capacity constrained from 1993 to 2001 and periodically thereafter. IPL stated that the capacity shortfall on the system is predicted to average 22 000 m<sup>3</sup>/d (138,000 b/d) between 1993 and 1998, peaking at a maximum of 25 100 m<sup>3</sup>/d (158,000 b/d) in 1996 and is then expected to decline slowly.

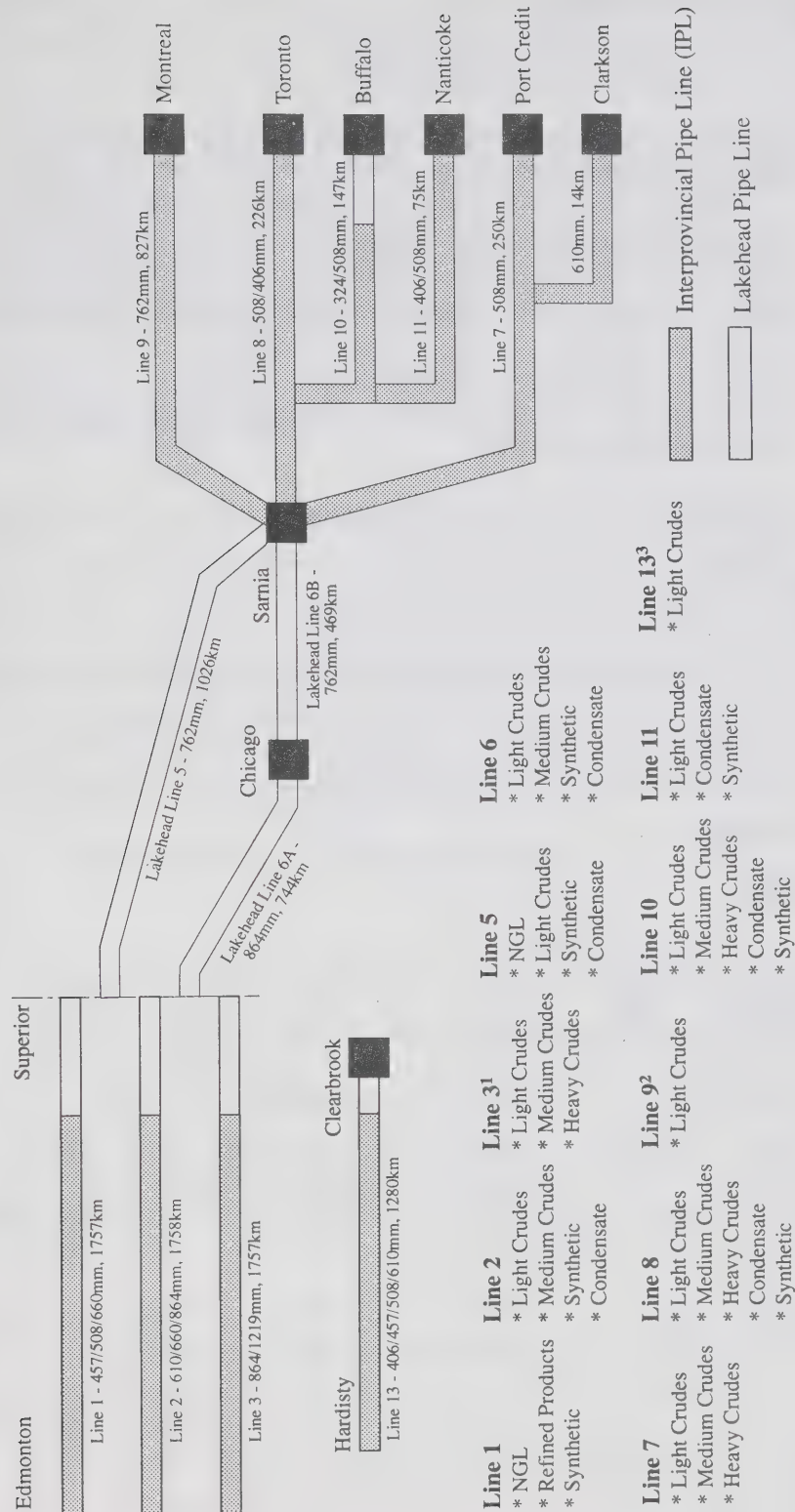
Based on information that IPL submitted in response to a Board information request, a breakdown of the incremental capacity which would result from the proposed expansion on IPL's Western Division and on Lakehead's system upstream of Superior, Wisconsin is summarized in Table 4-1.

IPL testified that the proposed expansion is operationally and economically optimized to achieve the lowest cost of service for the pattern of receipts and deliveries forecast for 1995. Also, this proposed system configuration could accommodate future expansion and growth in commodity streams such as NGL. A schematic representation of the IPL and Lakehead systems illustrating the products transported is shown in Figure 4-1.

**Table 4-1**  
**1995 Incremental Capacity**  
**(10<sup>3</sup>m<sup>3</sup>/d)**

	Edmonton to <u>Hardisty</u>	Hardisty to <u>Kerrobert</u>	Kerrobert to <u>Regina</u>	Regina to <u>Cromer</u>	Cromer to <u>Gretna</u>	Gretna to <u>Clearbrook</u>	Clearbrook to <u>Superior</u>
<b>Line 1</b>	2.6	2.6	2.6	2.6	2.6	2.6	2.6
<b>Line 2</b>	0.5	0.5	0.5	0.5	4.6	4.6	4.6
<b>Line 3</b>	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
<b>New Line 13</b>	-	24.6	24.6	24.6	9.0	24.6	-
<b>Total</b>	<b>2.5</b>	<b>27.1</b>	<b>27.1</b>	<b>27.1</b>	<b>15.6</b>	<b>31.2</b>	<b>6.6</b>

**Figure 4-1**  
**The IPL/Lakehead Pipeline System**  
**Post Expansion**



1. Additional 1767mm loops on Line 3 represent that portion of the system known as Line 4.
2. Medium and heavy crudes are also transported in Line 9 in the pre-expansion system.
3. Line 13 added as part of expanded system.



## 4.2 Expansion Facilities

IPL's applied-for expansion includes the following:

- the construction of 491.5 km of 508 mm (20 inch) diameter new pipeline from Hardisty, Alberta to Regina, Saskatchewan;
- the reactivation of 38.3 km of 508 mm (20 inch) diameter pipeline from Hardisty to Regina, 195.9 km of 406 mm (16 inch) diameter pipeline from Regina to kilometre post 900 and 58.7 km of 457 mm (18 inch) diameter pipeline from kilometre post 900 to Cromer, Manitoba;
- the construction of 2.8 km of 508 mm (20 inch) diameter pipeline from Gretna, Manitoba to the international border;
- the addition and modification of six pumping stations for the new pipeline and six pumping stations for Line 2; and
- the construction of four new storage tanks.

The new pipeline would be connected to an existing operating pipeline from Cromer to Gretna to provide a fourth line, to be designated as Line 13. The new line would transport light sweet crude oil. IPL testified that all of the design and construction of the expansion facilities would meet or exceed the requirements of the *National Energy Board Onshore Pipeline Regulations* and the CAN/CSA Z183-M90 Standards.

### 4.2.1 Pipeline

As described above, the proposed Line 13 would involve the construction of a new pipeline between Hardisty and Regina. Some 38.3 km (23.8 miles) of currently inactive 508 mm (20 inch) diameter pipeline would be reactivated and incorporated in the new section. Between Regina and Cromer, Line 13 would make use of currently inactive 406 mm (16 inch) and 457 mm (18 inch) diameter pipeline which would be reactivated. Also, between Regina and Cromer, IPL indicated that it would construct crossover piping between Line 13 and existing idle 610 mm (24 inch) Line 2 pipe at the loop-end locations, in effect, looping Line 13, to further increase capacity. Finally, IPL would incorporate the currently active 283 km (176 miles) of 406 mm (16 inch) diameter pipe between Cromer and Gretna into the new Line 13 to provide continuous service from Hardisty to Gretna.

A new 508 mm (20 inch) pipeline, 221 km (137 miles) long, would be constructed downstream of Gretna to continue Line 13 service to Clearbrook, Minnesota. At Gretna, IPL proposes to transfer streams which are currently shipped in Line 1 into the new Line 13 and transfer volumes from Line 13 to Line 1. Testimony indicated that this line switching would provide significant power and drag reducing agent ("DRA") savings, and would optimize the total capacity of the system. DRA is dealt with in more detail in subsection 4.2.4 of these Reasons for Decision.

IPL's routing of the proposed Line 13 requires crossing the South Saskatchewan River. IPL indicated that an open cut method of crossing the river was preferred to a directionally drilled crossing due to geotechnical concerns. In its preliminary assessment of the crossing, IPL identified a possible deep

seated slip plane in the proximity of the crossing site. IPL undertook to provide the Board with a detailed geotechnical assessment should a directionally drilled crossing of the river be required.

### ***Views of the Board***

The Board is of the view that the design and configuration of the proposed pipeline are appropriate and safe for their intended purpose. IPL will be required to seek approval pursuant to section 47 of the Act for leave to open all new and reactivated pipeline prior to the commencement of service. Should IPL directionally drill the South Saskatchewan River crossing, it will also be required to submit to the Board for approval, prior to construction, a detailed geotechnical report which would address the safe design and operation of the pipeline and the environmental concerns identified in section 6.3 of these Reasons for Decision.

## **4.2.2 Pumps**

IPL's proposed new Line 13 would require 14 pump units at six new pump stations located at various IPL existing sites. Also, IPL would upgrade six existing pumping units at Cromer and Glenboro, Manitoba. On Line 2, IPL applied to add one new pump at Herschel, Saskatchewan and upgrade eight pump units at five different locations. Table 4-2 lists the pump additions and upgrades for each line.

**Table 4-2  
Additional Pump Stations and Units**

<b><u>Line 13</u></b>				<b><u>Line 2</u></b>			
<b><u>Station</u></b>	<b><u>Status</u></b>	<b><u>No. of Units</u></b>	<b><u>Total Power (kW)</u></b>	<b><u>Station</u></b>	<b><u>Status</u></b>	<b><u>No. of Units</u></b>	<b><u>Total Power (kW)</u></b>
<b>Hardisty</b>	New	3	5035	<b>Herschel</b>	New	1	1119
<b>Kerrobert</b>	New	2	3358	<b>Odessa</b>	Upgrade	1	1865
<b>Loreburn</b>	New	2	3358	<b>Glenavon</b>	Upgrade	1	1865
<b>Regina</b>	New	2	3730	<b>Souris</b>	Upgrade	3	4845
<b>Glenavon</b>	New	3	5037	<b>Glenboro</b>	Upgrade	1	1865
<b>Cromer</b>	Upgrade	3	4105	<b>Gretna</b>	Upgrade	2	3730
<b>Glenboro</b>	Upgrade	3	5037				
<b>Gretna</b>	New	2	3730				

### *Views of the Board*

The Board is of the view that the applied-for pump additions and modifications are appropriate for the purposes of the proposed expansion. The Board is satisfied that the design is safe, and that construction and commissioning would be closely monitored to ensure that all standards and design requirements are met. The Board, pursuant to section 58 of the Act, would therefore exempt such pump station facilities from the requirements of leave to open.

#### **4.2.3 Tankage and Manifolds**

As part of the IPL expansion facilities, four welded steel tanks for oil storage are proposed: two at Hardisty and one tank each at Edmonton and Cromer. The two new tanks at Hardisty would be required to handle the breakout and injection volumes at the commencement of the proposed Line 13. Aside from tankage requirements specifically related to the handling of new volumes, IPL testified that the Cromer tank is further justified on the basis of facilitating maintenance at that tank farm. IPL has agreed to adopt any standards in API 650, July 1993, which would be mandatory requirements in the proposed CSA Z662 Standard as it pertains to welded steel tanks in oil storage service. IPL also undertook to use API RP 651 and API RP 652, as recommended in the proposed CSA Z662 Standard, as guidelines for corrosion protection. Furthermore, IPL testified that it would construct the containment dikes so that the containment volume would not be less than 110 percent of the volume of the largest tank within the dike's area, as indicated in the proposed CSA Z662 Standard. The capacity of the proposed new tankage is presented in Table 4-3.

IPL would also have to install additional manifold piping and valves at Regina to tie the new Line 13 into the reactivated line from Regina to Cromer. Wascana stated that additional IPL delivery tankage is also required at Regina to permit adequate deliveries of medium sour crude from IPL's Line 3 into the newly expanded Wascana system. The company requested that the Board's Decision allow for the additional delivery tankage capacity. IPL submitted that such tankage was outside the scope of the OH-1-93 proceeding.

**Table 4-3  
New Storage Tanks**

<u>Location</u>	<u>Tank No.</u>	<u>Capacity (m<sup>3</sup>)</u>
<b>Edmonton</b>	30	23 850
<b>Hardisty</b>	43	31 800
	44	31 800
<b>Cromer</b>	102	23 850



### ***Views of the Board***

The Board is of the view that the applied-for tankage is appropriate for the purposes of the proposed expansion. The Board is satisfied that the design is safe and that construction and commissioning will be closely monitored to ensure that all standards and design requirements are met. The Board, pursuant to section 58 of the Act, will therefore exempt such tank facilities from the requirements of leave to open.

With regard to Wascana's request for the Board to allow for delivery tankage at Regina, the Board notes that neither IPL nor Wascana put forward the necessary evidence for the Board to assess the environmental impact and review the engineering considerations of such tankage. If tankage is required to facilitate expanded crude oil movements on the Wascana system, either IPL or Wascana could file an application with the Board.

#### **4.2.4 Drag Reducing Agent**

DRA is a chemical additive that reduces the pressure gradient in the section of pipe in which it has been injected. The reduction in the pressure gradient results in a reduction of pumping power required to move throughput volumes. Thus, the spare power at the pumping stations created by the use of DRA may be used to move incremental volumes. IPL indicated that because DRA breaks down in pumping units, new DRA is required to be injected downstream of each pumping unit. IPL proposed to increase throughput capacity on Line 2 and Line 13 using DRA. IPL noted that DRA is most effective in light and synthetic crude oils. Therefore, IPL intends to inject DRA into certain batches that will gain the greatest capacity increase with the least DRA consumption. The use of DRA could contribute approximately 3 200 m<sup>3</sup>/d (20,000 b/d) of additional capacity to the system beyond the 23 900 m<sup>3</sup>/d (150,000 b/d) capacity gained from additional pipelines and pump facilities.

### ***Views of the Board***

The Board is of the view that the use of DRA on the IPL system is a cost effective means of gaining additional capacity without adding facilities. IPL is directed to use DRA only as required to augment system capacity. The prudence of expenditures related to the use of DRA will be examined in future Part IV proceedings.

#### **4.2.5 Contamination**

IPL and Lakehead operate their pipeline systems in a batch mode in which separate streams are transported directly adjacent to each other in the pipeline. This results in streams mixing at each interface. Interfacial mixing causes a limited amount of contamination in a stream by the time the stream is taken out of the pipeline at its delivery point.

IPL stated that the expansion would not have an impact on contamination. Indeed, some favourable changes in interfacial contamination might result from the proposed expansion due to a fuller utilization of Line 3 and less shutdown time. Suncor argued that as contamination costs are generally borne by the shippers, the design configuration selected may not take into account the minimizing of those costs. In particular, Suncor stated that the original configuration which had all synthetic crude oil in Line 1 would have resulted in less contamination of those batches than the proposed

configuration under which synthetic crude oil would be in Line 2. Suncor requested the Board give some direction to IPL to assist it in resolving general contamination issues. IPL testified that such concerns were taken into account as a criterion in system design optimization. In argument, IPL added that contamination is an industry matter and noted the existence of an industry task force to deal with product contamination on the pipeline system.

#### ***Views of the Board***

The Board is satisfied that concerns regarding contamination were taken into account in the design of the proposed expansion. In the context of the decision at hand, it is the Board's view that the proposed configuration is optimal in terms of minimizing contamination on a system-wide basis. IPL and its shippers are encouraged to continue their efforts to seek operational and facility-related solutions to ongoing concerns about contamination.

### **4.3 Alternatives to the Proposed Expansion**

Given the significant expansion needed to meet the required capacity and handle the crude oil volumes tendered for shipment, IPL indicated that the lowest costs for the largest capacity gain could only be accomplished with additional pipeline. In its application, IPL presented several expansion alternatives that were evaluated but were considered to be less attractive than the proposed expansion.

IPL evaluated the expansion alternatives based on cost effectiveness, suitability to provide for both short and long-term needs, and level of required operating flexibility. IPL indicated that the proposal in the 11 November 1993 amended application was selected because it was deemed to be the optimal design given the level of capacity increase required. IPL described the three next best alternatives which were evaluated against the \$256 million proposed expansion.

The first alternative was a new refined product line from Edmonton to Gretna. This was the option proposed in IPL's original application filed on 24 June 1993. IPL later rejected this option as, even with refinements, it only provided a capacity increase of 19 900 m<sup>3</sup>/d (125,000 b/d) which was viewed as insufficient to meet the forecasted throughput.

The second alternative was a new light crude line from Hardisty to Clearbrook, but it differed from the proposed expansion in that it only had nine pump stations and was not expandable to eleven stations. With a capacity increase of 21 000 m<sup>3</sup>/d (132,000 b/d), this option did not provide sufficient capacity to meet the forecasted throughput requirements of shippers nor did it have the capability to increase deliveries to Chicago. The estimated cost of this option was \$370 million.

A third alternative considered by IPL was a new heavy crude line from Hardisty to Clearbrook. This option provided additional capacity of 30 000 m<sup>3</sup>/d (189,000 b/d) which exceeded the forecasted incremental throughput requirements. This alternative was considered by IPL to be undesirable in view of the high estimated capital cost of \$440 million and the excess capacity.

#### ***Views of the Board***

The Board is satisfied that the applied-for expansion option is the most appropriate given the forecasted throughputs.

## 4.4 IPL Capital Cost Estimate

IPL provided a capital cost estimate of \$256 million for the proposed expansion facilities. A summary of the estimated direct costs is presented in Table 4-4. The direct costs, which total \$219 550 000, exclude costs related to engineering, accumulated funds used during construction, and general and administrative costs.

IPL provided an estimate of pipeline material costs of \$59 560 000. IPL obtained costs for pipe and coating from potential vendors. Estimates of other material costs, including costs associated with warehousing and taxes, were based on recent projects. IPL stated that the material markets have been stable and support a reasonable degree of confidence in the material cost estimates provided. Construction costs account for over 50 percent of the expansion facilities costs. IPL stated that actual construction costs for the last decade have been relatively stable. However, IPL also indicated that installation costs are very sensitive to factors such as concurrent pipeline construction and use of union or non-union labour. Therefore, IPL stated its estimates of pipeline construction costs were accurate to within minus 5 percent and plus 30 percent.

IPL indicated that its cost estimates for pumps and storage tanks were based on the cost of recently completed projects. IPL stated that these project costs have been fairly stable over the last few years and support a reasonable degree of confidence in the accuracy of the cost estimate.



**Table 4-4**  
**Summary of Capital Cost Estimate**  
**for IPL Expansion Facilities**  
(Thousands of 1994 Canadian dollars)

**Pipelines**

Materials .....	59 560
Land Acquisition .....	4 500
Construction .....	72 490
<b>Total .....</b>	<b>\$136 550</b>

**Tankage and Manifolds**

Edmonton	
Materials .....	3 830
Construction (Manifolds) .....	1 920
Hardisty	
Materials .....	13 390
Construction (Manifolds and pumps) .....	6 240
Regina	
Materials .....	1 200
Construction (Manifolds) .....	1 350
Cromer	
Materials .....	4 260
Construction (Manifolds) .....	3 210
<b>Total .....</b>	<b>\$35 400</b>

**Pumping Stations**

Materials .....	27 600
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**Construction By Station**

Hardisty .....	2 200
Herschel .....	710
Kerrobert .....	2 000
Loreburn .....	2 000
Regina .....	2 400
Glenavon .....	2 200
Cromer .....	2 600
Glenboro .....	2 600
Gretna .....	<u>2 400</u>
	19 110

Miscellaneous Impeller and Trims .....	890
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<b>Total .....</b>	<b>\$47 600</b>
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<b>Total IPL Estimated Direct Cost .....</b>	<b>\$219 550</b>
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**Table 4-5**  
**Summary of Capital Cost Estimate**  
**for Lakehead Expansion Facilities**  
(Thousands of 1994 Canadian dollars)

Gretna to Superior Facilities .....	87 000
Line 5 .....	30 000
Line 6A .....	58 000
Facilities at Superior .....	5 000
<b>Total Lakehead Expansion Cost .....</b>	<b>\$180 000</b>

## 4.5 Downstream Facilities

IPL testified that the capital cost estimate for the proposed downstream expansion facilities on Lakehead is \$180 million (in 1994 Canadian dollars). Therefore, the total estimated cost of the IPL and Lakehead expansion facilities is \$436 680 000. A summary of the Lakehead expansion costs is presented in Table 4-5.

IPL indicated that Lakehead plans to construct 217.9 km of 508 mm (20 inch) diameter pipe from the international border near Gretna, Manitoba to Clearbrook, Minnesota. Lakehead would construct the proposed 508 mm (20 inch) diameter pipeline from Gretna to Superior, Wisconsin; however, IPL would oversee the Canadian portion of the proposed construction. Lakehead also plans to construct two new tanks and associated terminalling, and install one additional pump on Line 2 at Clearbrook. Furthermore, Lakehead plans to construct one new tank and perform a significant booster pump upgrade project at Superior. East of Superior, Lakehead plans to perform upgrades on Line 5 and Line 6 upstream of Chicago (also known as "Line 6A") to increase the capacity on those lines by approximately 8 780 m<sup>3</sup>/d (55,000 b/d) and 6 380 m<sup>3</sup>/d (40,000 b/d) respectively. IPL testified that there is currently 7 980 m<sup>3</sup>/d (50,000 b/d) of net spare capacity on Lines 5 and 6A. By displacing crude oil volumes destined for Sarnia from Line 6A into Line 5, IPL testified that with the expansion it could create net additional capacity of 23 100 m<sup>3</sup>/d (145,000 b/d) on Line 6A. Although the plan to displace additional crude oil volumes into Line 5 would not leave any spare capacity on Line 5, the evidence provided by IPL indicated that the Lakehead expansion would still provide the flexibility of shipping crude oil or equivalent volumes destined for Ontario and PADD I via Lakehead's Line 6A and 6B<sup>1</sup>. IPL indicated that the plan to expand capacity on both Lines 5 and 6A results in the most economic expansion of the Lakehead system. A summary of the current capacity, expanded capacity and forecasted throughput on the Lakehead system is provided in Table 4-6.

<sup>1</sup> Line 6B is the extension of the Lakehead system from Griffith, Indiana to Sarnia, Ontario.

**Table 4-6**  
**Summary of Capacity and Throughput on Lakehead System**  
**(10<sup>3</sup>m<sup>3</sup>/d)**

<u>Pipeline Segment</u>	<u>Current Capacity</u>	<u>Proposed Expansion Capacity</u>	<u>Forecasted Throughput (1995)</u>	<u>Surplus/ (Shortfall)</u>
Clearbrook	202.6	233.8	217.4	16.4
Line 5	76.3	85.2	85.2	0.0
Line 6A	94.6	100.8	94.8	6.0
Line 6B	68.6	67.0	35.9	31.1

IPL's proposed expansion of the Lakehead system assumed that the flow on Line 9 from Sarnia to Montréal would be reversed in 1999. As a result Ontario refineries would receive imported crude oil via the Portland to Montréal pipeline and a reversed Line 9. Western Canadian crude oil previously shipped to Ontario would be displaced to PADD I and PADD II markets. At the request of APMC, IPL also provided evidence based on an alternative scenario for the reversal of Line 9. The scenario, specified by APMC, assumed a Line 9 reversal in 1996 initially capable of shipping only 25 500 m<sup>3</sup>/d (160,000 b/d), increasing to 35 000 m<sup>3</sup>/d (220,000 b/d) per day for 1997 and 1998 before reaching 46 100 m<sup>3</sup>/d (290,000 b/d) in 1999.

For the 1996 Line 9 reversal scenario, IPL indicated that, in 1997, 4 700 m<sup>3</sup>/d (29,600 b/d) of crude oil or equivalent would have to be displaced to alternative markets via non-IPL pipeline systems due to a shortfall of capacity on Lines 5 and 6A combined. Aside from that limitation, the proposed expansion would have sufficient capacity to ship forecasted crude oil or equivalent volumes to markets in PADDs I and II for the 1996 Line 9 reversal scenario.

The Group of Eight testified that the reversal of Line 9 as early as 1996 is unlikely.

IPL indicated that the proposed capacity addition on Lakehead's Line 6A is only required to meet small shortfalls in capacity for a limited number of years. Suncor argued that the capacity expansion should be deferred on Line 6A since it will not be required to meet the throughput requirements until later in the forecast period. To that end, Suncor requested that the Board state a view in these Reasons for Decision on whether the expansion of Lakehead's Line 6A would be an appropriate component of the overall proposed IPL and Lakehead system expansion.

On the other hand, APMC argued that the 23 100 m<sup>3</sup>/d (145,000 b/d) capacity increase on Line 6A would provide shippers with the maximum flexibility at the lowest associated capital cost to access the favoured Chicago area markets. The Group of Eight also testified that it supported the capacity expansion on Line 6A as it provided additional flexibility for the disposition of crude oil production.



### ***Views of the Board***

The Board has reviewed the adequacy of downstream capacity and is satisfied that the facilities provided in Lakehead's expansion plans are compatible with IPL's expansion of its Western Division. As Lakehead's system is outside the Board's jurisdiction, the Board does not express any view regarding the specifics of the Lakehead expansion.

## Chapter 5

# Notification, Routing and Land Matters

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### 5.1 Early Public Notification

In accordance with the Board's Memorandum of Guidance Concerning Early Public Notification of Proposed Applications ("EPN"), IPL initiated its notification program in respect of the proposed expansion in late May 1993 with public activities concentrated during the period 17 June to 17 July, 1993. IPL continued its early public notification activities in September subsequent to filing revisions to the application on 17 September 1993. IPL indicated that it proposed to conduct similar activities in November respecting the amendments to the application filed with the Board on 11 November 1993.

Through its EPN program, IPL solicited and encouraged public input on the environmental and socio-economic effects of the proposed application and responded to all related public queries. The information program included notifications placed in local newspapers, and correspondence with landowners, municipalities, provincial and federal government agencies and departments, provincially and federally elected officials, and various public interest groups.

On 21 June 1993, IPL sent a project notification letter to all 1,860 landowners and tenants along the affected existing IPL right-of-way in western Canada. This letter was accompanied by a general project information brochure and advised of the scheduled location and dates of the EPN open house/information meetings. A total of seven information meetings was held between July and November 1993. As well, IPL had earlier placed project notices in a total of 19 local and regional newspapers whose circulation covered the project route in Alberta, Saskatchewan and Manitoba. Further, IPL put in service a toll-free telephone number on 17 June 1993 to facilitate contact with IPL by individuals anywhere in Alberta, Saskatchewan and Manitoba. The toll-free number was noted in all letters sent to the various EPN audiences. This number was also noted in both the general and detailed project-information brochures as well as in the project notices published in the local and regional newspapers.

As a result of its EPN program and subsequent consultations, IPL received and responded to approximately 190 inquiries as of 11 November 1993, the date on which it filed its revised application.

IPL provided the Board with tables summarizing all inquiries made during the notification process, and any action IPL had taken in response to the letters and inquiries received. At the request of the Board, IPL filed copies of some of the letters received and the responses. The Board also requested an additional summary which provided greater detail regarding the concerns raised by government agencies and public interest groups. This summary included all environmental, land-use and socio-economic recommendations or requirements of the above-mentioned agencies or groups, and provided explanations for any recommendations with which IPL did not agree.

IPL indicated that, with the exception of the possible directional drilling of the South Saskatchewan River crossing and restrictions on the timing of construction associated with white-tail deer in

Saskatchewan, it was receptive to the concerns received. However, it indicated there may be a need to hold additional discussions with affected parties as the design of the project is finalized.

Regarding the South Saskatchewan River crossing, the Saskatchewan Department of Environment and Resource Management ("SERM") requested IPL to directionally drill the river if geotechnically feasible and to modify its proposed spoil storage procedures if the watercourse is to be open cut. This issue is dealt with in more detail in subsection 6.3.2 of these Reasons for Decision.

With respect to white-tailed deer fawning concerns expressed by SERM, IPL indicated that SERM recognized the difficulties associated with the identification of fawning areas and that no rigid time constraints apply.

### *Views of the Board*

The Board is satisfied that IPL has notified and discussed the proposed application in a timely fashion with government agencies, public interest groups and affected landowners and responded appropriately to concerns expressed.

## **5.2 Route and Facility Selection**

### **5.2.1 Pipeline Route Selection**

The pipeline route is generally located within an agricultural setting with few significant routing constraints. Routing of the proposed pipeline was influenced by IPL's desire to minimize, where feasible, the number of new lands affected and the amount of land disturbance. Consequently, consideration was generally not given to alternative routes and the existing pipeline corridor was chosen as the preferred route because of the following:

- the existing route has been in service for approximately 40 years and is well known to all parties;
- no significant routing constraints are present along the proposed route;
- impacts associated with a widening of the existing pipeline corridor would be incremental whereas a new route would affect additional lands and increase the amount of land disturbance; and
- pipeline surveillance and maintenance activities can be conducted more efficiently for pipelines located within a common right-of-way than for rights-of-way that are geographically separate.

Where new facilities could not be located on existing easements due to easement width constraints, IPL proposed that they be located adjacent to the existing easements. All proposed pipeline sections are either within or adjacent to existing IPL rights-of-way.



## **5.2.2 Station Facilities**

The addition and modification of pumping units required for the project will be located within IPL's existing pump station boundaries.

The new tankage facilities required for the project will be located on lands owned by IPL adjacent to existing IPL terminals at Edmonton, Hardisty and Cromer.

### ***Views of the Board***

The Board agrees with IPL's rationale for locating the proposed new pipeline either within existing easements or adjacent to existing easements with associated temporary work space. The general route proposed by IPL for the new pipeline is accepted by the Board.

## **5.3 Land Requirements and Acquisition**

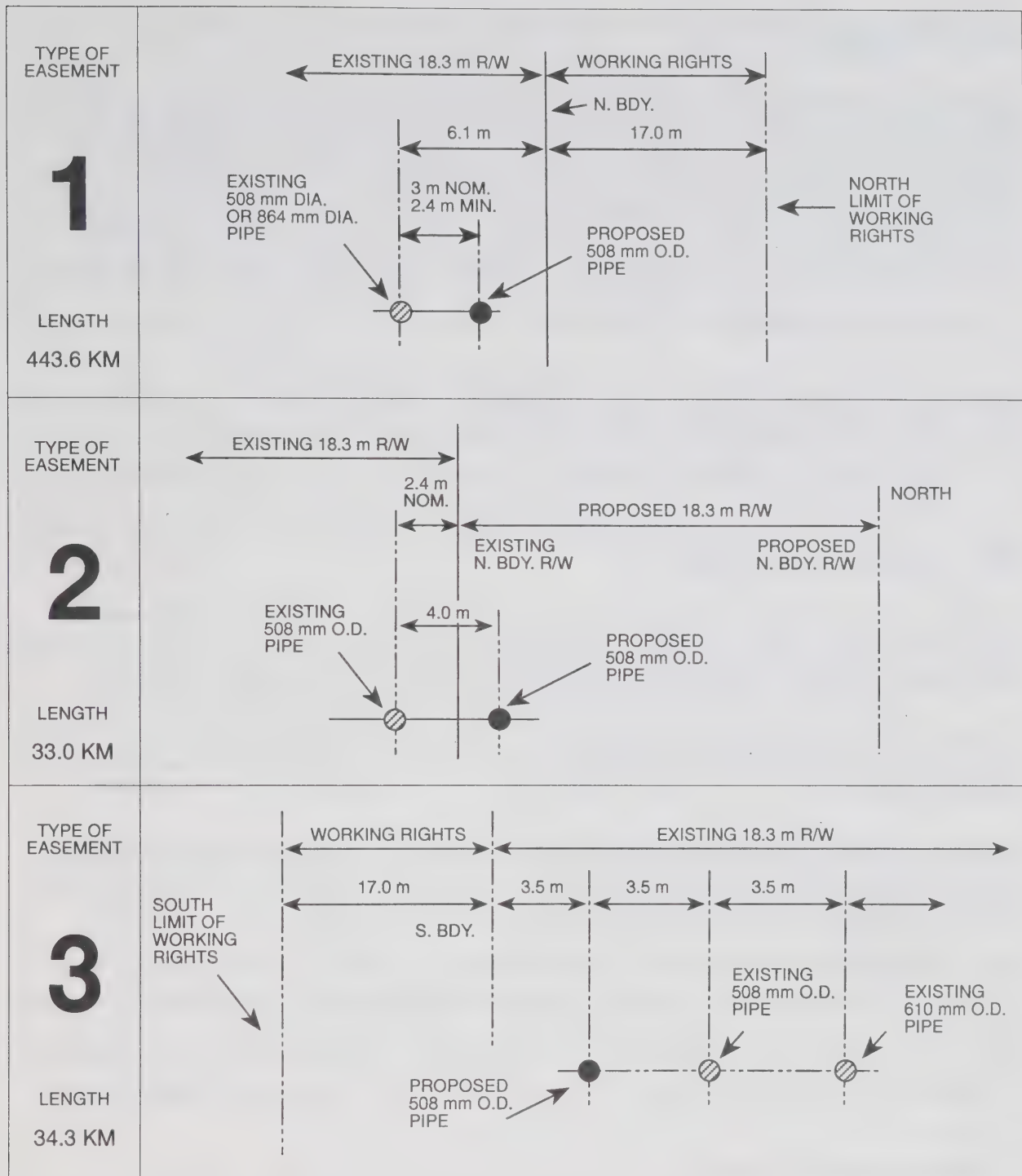
### **5.3.1 Land Requirements**

IPL has applied for a total of 494.3 km of line pipe, consisting of 491.5 kms between Hardisty, Alberta and Regina, Saskatchewan and 2.8 km between Gretna, Manitoba and the international border. The location, length and land requirements for the proposed pipeline are found in Table 5-1. IPL provided the rationale for its specific land requirements and included schematics of these requirements.

IPL indicated that no new fee simple lands will be required for the proposed facilities, as the additions and modification of pumping units will be located within existing pump station boundaries. Furthermore, the proposed four new tanks will be located on lands owned by IPL.

IPL proposes to acquire 33.0 kms of new permanent right of way (18.3 m wide) adjacent to the existing IPL rights-of-way. IPL would also acquire 480.3 km of temporary working rights (17.0 m wide) in selected areas along the rights-of-way to facilitate the construction of the new line pipe that is within the existing right-of-way. The right-of-way configuration is set out in Figure 5-1.

**Figure 5-1**  
**Schematic of**  
**New Permanent and Temporary Land Rights**



**Note:** Configurations 1 and 3 above identify the temporary working rights located on the north and south limits respectively. Configuration 2 sets out the location of the new permanent easement.

### 5.3.2 Acquisition

During cross-examination, IPL undertook to update the Board on any additional permanent easements that are identified. Further, IPL agreed to update the property line list as to the service of notices of proposed land acquisitions under section 87(1) of the Act and the status of land acquisition. IPL indicated that it considers the acquisition of temporary working rights to be a contractual matter between the landowner and IPL. Therefore, IPL does not plan to serve subsection 87(1) notices for temporary working rights. IPL would serve a subsection 87(1) notice and initiate a right of entry proceeding pursuant to section 104 of the Act if temporary working rights could not be negotiated.

#### *Views of the Board*

The amount of permanent easements and temporary work space required for pipeline construction is generally of concern to the Board because of the potential effects on landowners. In the present application, the Board finds that IPL's anticipated requirements for permanent easements and temporary work space are reasonable and justified.

### 5.4 Multiple Line Rights

In response to an information request from the Board, IPL filed copies of its standard easement agreements for the provinces of Alberta and Saskatchewan. The Board notes that the use of the phrase "one or more pipelines" appears in the agreements to be utilized for the proposed expansion.

IPL indicated that in its opinion, the provisions of the proposed Agreements for Easement for Alberta and Saskatchewan are consistent and provide for full compliance with the requirements of paragraph 86(2)(e)<sup>1</sup> of the Act.

Specifically, clause 18 of the proposed Agreements for Easement provides that the consent of the landowner is an absolute precondition to IPL acquiring any right to the future use of the right-of-way for the construction and operation of an additional pipeline or pipelines.

IPL's position is that it is in the public interest to provide for future use of the right-of-way in its Agreements for Easement. IPL explained that, where an owner consents to such future use, the cost of renegotiating, executing and registering a subsequent easement for such future use is avoided. In IPL's view, the owner of the right-of-way is not prejudiced by the provision for approved future use of the right-of-way in that it is anticipated that the consent of the owner to any future additional use

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<sup>1</sup> This section reads in part as follows:

- " 86. (1) Subject to subsection (2), a company may acquire lands for a pipeline under a land acquisition agreement entered into between the company and the owner of the lands or, in the absence of such an agreement, in accordance with this Part.
- (2) A company may not acquire lands for a pipeline under a land acquisition agreement unless the agreement includes provision for...
- (e) restricting the use of the lands to the line of pipe or other facility for which the lands are, by the agreement, specified to be required unless the owner of the lands consents to any proposed additional use at the time of the proposed additional use; and..."



would only be granted upon the negotiation of such matters as were considered to be applicable by the owner at such future time including, in particular, the payment of additional compensation.

During cross-examination, the Board questioned IPL on the elements of that additional compensation. IPL testified that the cost savings of including multiple line rights subject to the restrictions contained in clause 18 of its proposed easement agreements, rather than entering into an entirely new easement agreement, would include the cost of preparing new easement agreements, copying and distributing the new agreements, reviewing the new agreements with land agents, reviewing the agreements with each landowner along the existing right-of-way, attending to the formal execution of the agreements, updating land title searches to the existing right-of-way, registering the right-of-way documents, preparing registration reports, providing copies of the registration to the landowners and opening and maintaining files for all new agreements.

IPL indicated that the payment of additional compensation would be a negotiated amount agreed to by the landowner for the granting of consent to construct and operate an additional pipeline. The amount of the compensation would be based on the market value of the land utilized for the additional pipeline, and would be in addition to any compensation paid by IPL as indemnification to the landowner for loss or damage suffered as a result of the construction or operation of a pre-existing pipeline.

#### *Views of the Board*

The Board has reviewed IPL's easement agreements, particularly clause 18 and the responses to a number of Board requests for additional information on this matter. The Board is concerned about the rights of landowners, even with the presence of clause 18 if at some time in the future, additional pipelines are required and a landowner has signed an agreement allowing multiple lines.

However, the Board notes that a new agreement of some form would be required in the event that new land rights have to be acquired for any additional pipelines. The Board also notes that IPL has indicated that any future use of the land will be subject to negotiation of such matters as were considered to be applicable by the owner at the future time including additional compensation based on the market value of the land as well as damages for the construction and operation of any additional pipeline.

**Table 5-1**  
**Land Requirements for the**  
**IPL Proposed Western Canadian Pipeline Expansion**

Line Description	Km Post				Permanent Easement		Temporary Work	
	To		From	Length (km)	Width (m)	Length (km)	Width (m)	Length (km)
Hardisty to Metiskow	175.4	-	177.6	2.2 <sup>1</sup>	18.3	1.7	-	-
	177.6	-	191.3	13.7	-	-	17.0	13.7
	191.3	-	194.1 <sup>2</sup>	2.8	18.3	2.8	-	-
	194.1	-	229.6	<u>35.5</u>	-	-	17.0	35.5
				<b>54.2</b>				
Metiskow to Cactus Lake	229.6	-	279.7	50.1	-	-	17.0	50.1
	279.7	-	283.3 <sup>2</sup>	3.6	18.3	3.6	-	-
	283.3	-	289.9	<u>6.6</u>	-	-	17.0	6.6
				<b>60.3</b>				
Cactus Lake to Kerrobert	289.9	-	326.8	36.9	-	-	17.0	36.9
	326.8	-	328.6	1.8	18.3	1.8	-	-
	328.6	-	339.8	11.2	-	-	17.0	11.2
	339.8	-	345.6 <sup>2</sup>	5.8	18.3	5.8	-	-
	345.6	-	349.4	3.8	-	-	17.0	3.8
	349.4	-	351.3 <sup>2</sup>	<u>1.9</u>	18.3	1.9	-	-
				<b>61.4</b>				
Kerrobert to Herschel	351.3	-	353.2 <sup>2</sup>	1.9 <sup>1</sup>	18.3	1.4	-	-
	353.2	-	364.8	11.6	-	-	17.0	11.6
	364.8	-	370.1 <sup>2</sup>	5.3	18.3	5.3	-	-
	370.1	-	391.8	21.7	-	-	17.0	21.7
	391.8	-	395.4 <sup>2</sup>	3.6	18.3	3.6	-	-
	395.4	-	413.6	<u>18.2</u>	-	-	17.0	18.2
				<b>62.3</b>				
Herschel to Milden	413.6	-	463.2	49.6	-	-	17.0	49.6
	463.2	-	465.8 <sup>2</sup>	2.6	18.3	2.6	-	-
	465.8	-	475.1	<u>9.3</u>	-	-	17.0	9.3
				<b>61.5</b>				
Milden to Loreburn	475.1	-	504.2	29.1	-	-	17.0	29.1
	504.2	-	506.7	2.5	18.3	2.5	-	-
	506.7	-	538.1	<u>31.4</u>	-	-	17.0	31.4
			<b>63.0</b>					
Loreburn to Craik	538.1	-	590.7	<u>52.6</u>	-	-	17.0	52.6
			<b>52.6</b>					
Craik to Bethune	590.7	-	653.0	<u>62.3</u>	-	-	17.0	62.3
			<b>62.3</b>					

**Table 5-1**  
**Land Requirements for the**  
**IPL Proposed Western Canadian Pipeline Expansion (continued)**

Line Description	Km Post				Permanent	Easement	Temporary Work	
	To		From	Length (km)	Width (m)	Length (km)	Width (m)	Length (km)
Bethune to	653.0	-	687.3	34.3	-	-	17.0	34.3
Regina	687.3	-	704.2 <sup>3</sup>	<u>16.9</u>	-	-	-	-
				51.2				
Gretna to	1242.8	-	1245.2	<u>2.4</u>	-	-	17.0	2.4
International Border				2.4				
Total: Hardisty to to International Border				<u>513.3</u>		<u>33.0</u>		<u>480.3</u>

<sup>1</sup> Does not include 0.5 km within the station.

<sup>2</sup> Options for easements will be obtained in the sections of existing pipeline where the pipe integrity is yet to be confirmed.

<sup>3</sup> 16.9 km existing deactivated 508 mm (20 inch) pipe utilized.



## Chapter 6

# Environmental and Socio-Economic Matters

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### 6.1 Assessment Process

IPL submitted various environmental and socio-economic assessment reports ("the assessment reports"), the results of soil and rare plant surveys ("the survey reports"), and further environmental evidence in support of its application. The information submitted by IPL provided a description of the environmental and socio-economic setting, an assessment of the potentially adverse environmental effects, and recommendations to avoid, prevent or mitigate the adverse environmental effects resulting from the applied-for facilities. In addition, an Environmental Issues List ("EIL"), which summarized the recommended practices and procedures to avoid, prevent or mitigate specific adverse environmental effects, was provided. IPL adopted the policy statements provided in its "Environmental Standards and Guidelines for Pipeline and Facility Construction" (1993) and "Environmental Guidelines for Station Construction" (1993).

### 6.2 Public Concerns and Specialist Advice

As a result of the EPN process for the expansion proposal, IPL was apprised of a number of concerns regarding the proposed application.

The Prairie Farm Rehabilitation Administration ("PFRA"), under Agriculture Canada, identified two concerns in respect of PFRA properties affected by the proposal: disturbance of grazing operations and the restoration of disturbed lands.

Alberta Environment expressed concerns to IPL related to odour problems in the Hardisty area, the requirement to obtain provincial approvals for watercourse crossings, and timing constraints relating to wildlife concerns. Alberta Agriculture, Food and Rural Development drew IPL's attention to concerns related to public lands which would be affected by the proposal.

SERM expressed concerns to IPL relating to disturbance of soils, fisheries, vegetation and wildlife resources. SERM also indicated that a letter of authorization would be required before initiating construction on Crown lands which fall under the *Wildlife Habitat Protection Act*, and that provincial approvals would be required for watercourse crossings.

Specific concerns were also raised by other federal, provincial and municipal government agencies. IPL addressed all concerns with the appropriate parties, and indicated that it would keep the Board informed about a number of unresolved issues, as discussions continue.

In addition to the EPN process, the Board requested specialist advice pursuant to section 19 of the EARP Guidelines Order from the Federal Department of Fisheries and Oceans ("DFO") to address fish and fish habitat related concerns, and from Environment Canada to address the Committee on the Status of Endangered Wildlife in Canada's ("COSEWIC") wildlife and wildlife habitat concerns. IPL responded to the concerns raised by these agencies.

## **6.3 Pipeline Facilities**

### **6.3.1 Soils and Agriculture**

The potential loss of agricultural capability is the dominant environmental concern during pipeline construction since most of the route is on agricultural land. IPL adopted its standard practices, as well as the additional measures identified in its assessment reports and soil survey report, to restore the agricultural capability of the disturbed lands to pre-construction conditions.

IPL conducted a soil investigation along the proposed pipeline right-of-way, which identified areas with potential for topsoil loss, wind erosion, water erosion, and soil compaction. The soil survey report indicated that to ensure that the quality of agricultural land is maintained, the total depth of topsoil should be salvaged, up to a maximum of 40 cm. IPL indicated that it would conserve topsoil by utilizing various topsoil stripping methods under appropriate conditions, and would replace the topsoil during non-frozen ground conditions following backfilling and re-contouring.

In addition, the investigation identified approximately 65 km of the route that may require alternative soil handling procedures due to the existence of problem soils. IPL undertook to carry out further soil sampling and analyses in these areas prior to construction to determine whether alternative soil handling procedures are required, and file the results with the Board.

IPL identified a number of measures that could be implemented to address soils prone to wind and water erosion. In areas with soils prone to wind erosion, IPL indicated that it would conserve the upper 10-15 cm of soil for reclamation purposes, undertake special measures where topsoil erosion became evident, and straw crimp during final cleanup on areas with soils difficult to revegetate. In areas with soils prone to water erosion, IPL indicated that it would minimize grading, and re-contour the right-of-way following construction. On moderately steep slopes, IPL indicated it would install trench breakers, diversion berms and cross ditches to create a stable ground condition.

In order to minimize adverse effects during wet soil conditions, IPL indicated that it would temporarily suspend work until the soils had sufficiently dried, or implement special measures. IPL indicated that it intends to shut down construction if there was danger of creating deep ruts. However, if deep ruts occur, IPL would implement special measures to rehabilitate the soils, such as the addition of organic matter. IPL indicated further that in the event that subsoil compaction occurred, it could be mitigated by ripping, chisel plowing, cultivating, and, if required, by the use of a subsoiler.

IPL undertook to prepare livestock management plans for the affected community pastures operated by PFRA, and file these plans with the Board. As well, IPL undertook to notify all pasture and grazing operators of the special measures, such as temporary fencing, that could be undertaken to ensure the successful revegetation of the disturbed pasture or grazing lands.

Irrigated farmlands would be affected in the vicinity of the South Saskatchewan and Qu'Appelle Rivers. IPL indicated it would implement special measures to ensure that in such areas, irrigation systems and local drainage would not be affected during construction or during the operation of the pipeline.



### **6.3.2 Fisheries and Hydrology**

IPL conducted, and filed with the Board, a fisheries impact evaluation detailing watercourse sensitivities, mitigative measures, timing constraints, crossing methods and vehicle access methods. Only three watercourses with fisheries potential, all of which are located in Saskatchewan, would be crossed. The three watercourses have an instream timing constraint of 15 April to 1 June, in which construction is normally not permitted due to spring spawning fisheries. In addition, the South Saskatchewan River has fall spawning fisheries with an instream timing constraint of 15 September to 1 November.

IPL outlined a number of standard mitigative measures to be followed for all watercourse crossings in an effort to limit potential environmental effects associated with those crossings and provide an appropriate level of protection. In addition, IPL indicated that it would obtain appropriate federal and provincial approvals, and adhere to any conditions placed on the approvals. For the three sensitive watercourses, IPL undertook to provide to the Board and DFO prior to the commencement of construction, copies of the geotechnical investigations, site specific crossing plans and sediment control plans. IPL indicated further that, should construction occur during the sensitive timing constraint period, certain alternative crossing procedures would be implemented and instream sediment control devices would also be considered.

The most significant watercourse crossing along the pipeline route would be the South Saskatchewan River crossing. IPL indicated that if the crossing could be completed outside of all the timing constraints related to fisheries and wildlife concerns, it would conduct an open cut crossing of the river. However, if the crossing had to occur within a timing constraint window, IPL undertook to complete a directionally drilled crossing of the river. IPL undertook further to submit to the Board prior to the commencement of the river crossing by directional drilling, a detailed crossing plan, as well as additional information and plans on the handling and disposal of drilling waste materials.

IPL indicated that it plans to notify downstream water users prior to the commencement of instream construction. In addition, if the Town of Outlook's water supply were to be adversely affected by the South Saskatchewan River crossing, IPL indicated that it would compensate or, where feasible, make available alternative water supplies to domestic water users. IPL undertook to bore the irrigation canals in the vicinity of the South Saskatchewan River to avoid disruption to downstream users.

With respect to hydrostatic testing, IPL indicated that it would obtain the appropriate provincial approvals for the taking and discharging of test waters, and adhere to all the conditions of the approvals. IPL would ensure that intake screens would be used where warranted and, if requested by provincial authorities, IPL would also ensure that water users within 10 km downstream of hydrostatic test water sources were notified. In addition, IPL undertook to collect representative water samples and consider a number of water quality parameters for sampling analysis. IPL indicated that it would implement measures presented in its Emergency Response Plan in the event of accidental release of contaminated hydrostatic test water.

### **6.3.3 Vegetation**

IPL submitted to the Board the results of the fall survey of special conservation status vascular plant species, consisting of species on the COSEWIC list, as well as others considered rare or endangered by provincial or federal authorities. The survey report identified three sites along the route, all located



in Alberta, which support four special conservation status plant species. For a more complete evaluation, IPL indicated that it would have its environmental inspectors survey areas of high potential for special conservation status plant species, prior to the commencement of construction in those areas. IPL indicated that a botanist or a plant ecologist would be available to the environmental inspectors during construction to assist in the identification of plants.

Disturbance of native pasture is a concern in Alberta and Saskatchewan. IPL indicated that to limit the area of disturbance, it would minimize grading and scalping of sod during topsoil stripping and replacement. IPL would also consider the use of specialized equipment, such as the "prairie protector", if appropriate, during backfilling. IPL indicated further that it would monitor these areas for the effectiveness of its mitigative measures, and take appropriate action if further mitigation was required.

IPL identified various seed mixtures that it would use during final cleanup. Environment Canada made a number of recommendations to change the mixtures, to which IPL responded with revised seed mixtures. During the hearing, IPL indicated to the Board that it would ensure that any outstanding concerns with Environment Canada would be brought to the Board's attention.

#### **6.3.4 Wildlife**

IPL indicated that, prior to the commencement of construction, its environmental inspectors would survey areas which could support wildlife species having special conservation status. Such areas include native pasture containing burrowing owls and sharp-tailed grouse leks, large trees that may contain active raptor nests, and, in the proximity of the South Saskatchewan River crossing, habitat where the endangered piping plover may nest. Environment Canada provided spring and early summer timing constraints for sharp-tailed grouse leks, and burrowing owl, piping plover and raptor nests that are located in proximity of construction activities. IPL submitted that it would adhere to the distance and timing constraints as determined by the applicable government agency, and would advise the Board if there were any changes to these constraints.

Four locations along the pipeline route in Saskatchewan have been designated under the Saskatchewan *Wildlife Habitat Protection Act*. IPL undertook to obtain, prior to construction, letters of authorization from SERM for these properties. With respect to white-tailed deer fawning concerns expressed by SERM, IPL indicated that SERM recognized the difficulties associated with the identification of fawning areas and that no rigid time constraints would apply.

#### **6.3.5 Archaeological and Heritage Resources**

IPL identified the need for heritage resources surveys and/or impact assessments for the Hardisty to Regina pipeline. IPL indicated that the field surveys would be completed during the fall of 1993, with the final reports to be submitted to the appropriate provincial agencies, and to the Board, for review. Due to the lack of heritage resources potential along the portion of the route between Gretna and the U.S. border, the provincial agency indicated to IPL that no heritage resources survey was required.

IPL indicated that it did not expect any difficulties in receiving applicable clearances to permit construction to proceed as scheduled. IPL undertook to advise the Board of any recommendations from the survey results or the provincial agencies which IPL could not accept, its rationale for not

accepting the recommendation, and evidence of the acceptance of the alternative mitigative measures by the appropriate provincial agency.

### **6.3.6 Environmental Inspection and Post-Construction Monitoring**

IPL indicated that it would employ independent and suitably qualified environmental inspectors to conduct environmental inspections during the construction of the proposed pipeline. IPL indicated that the inspectors would have the authority to direct all activities that could adversely affect the environment, as well as have the authority to suspend a certain activity that was causing or would result in unacceptable environmental impacts until conditions or modifications to the procedures were implemented by IPL.

IPL indicated that it would conduct training seminars prior to construction to ensure that its environmental inspectors were familiar with all the documents submitted during the OH-1-93 proceeding. The training would also cover the relevant permits and approvals from other federal and provincial agencies, and inspectors would be given specialized training in the field identification of special conservation status wildlife and plant species and the potential habitats where these species may be found. In addition, prior to the commencement of construction, IPL would conduct an environmental seminar to ensure that all IPL inspectors and the contractors' supervisory staff understood the environmental protection measures, specifications and responsibilities.

IPL undertook to provide the Board, prior to the commencement of construction, with an updated version of the Environmental Issues List, which would include any environmental issues and corresponding mitigative measures and commitments relevant to the project. IPL further indicated that an as-built environmental report would be prepared and submitted to the Board following construction. In addition, IPL would conduct one and two year post-construction studies to monitor the status of unresolved environmental issues. IPL undertook to continue its monitoring program until all issues were resolved.

#### ***Views of the Board***

The Board is satisfied with the environmental information provided by IPL with regard to the potentially adverse environmental effects which may result from the construction and operation of the proposed pipeline facilities. Furthermore, the Board is satisfied with IPL's proposed mitigative measures and monitoring program, as well as IPL's undertakings to file additional information with the Board relating to environmental matters. The Board notes that IPL has agreed to keep the Board informed of the results of discussions with special interest groups and regulatory agencies, providing details of any site-specific mitigative measures and constraints that may affect the construction program. The Board will condition any certificate so as to ensure adherence to those measures and undertakings, and approval by the Board of any changes to those measures and undertakings prior to their implementation.

With respect to IPL's proposal for the crossing of the South Saskatchewan River, the Board agrees that due to geotechnical considerations, an open cut method may be preferable to a directionally drilled crossing. The Board notes that a directionally drilled crossing would be undertaken only if IPL could not avoid the environmental timing constraints related to fisheries and special conservation status wildlife species.



Should it be necessary for IPL to directionally drill the South Saskatchewan River, the Board will require IPL to submit, prior to commencement of construction of the river crossing, a detailed plan for the crossing and the disposal of drilling wastes.

With respect to the proposed seed mixtures, the Board notes that Environment Canada has expressed concerns regarding the use of certain species in areas that may result in habitat alteration. The Board supports the position of Environment Canada recognizing, however, that IPL must also satisfy individual landowners along its route. The Board is of the view that IPL and Environment Canada should be able to resolve this issue through further discussions and will condition any approval to require that IPL submit to the Board the results of these discussions.

In order to determine whether the environmental objectives have been achieved, the Board will require IPL to file a post-construction environmental as-built report for the new pipeline within six months of the date that leave to open is granted. The Board will also require IPL to file similar reports by 31 December following each of the first two full growing seasons after construction.

## **6.4 New and Replacement Pump Units**

Increased noise emissions could potentially be a significant effect as a result of the proposed new and replacement pump units. IPL indicated that, given the design criteria for newly installed units, it did not anticipate any problems in achieving IPL's standard for noise emissions of 40 dB(A), measured 15 m from affected dwellings. IPL undertook to provide the Board with the results of before and after noise surveys of the pump stations where new or replacement pumps would be installed.

### ***Views of the Board***

The Board is of the view that if IPL's proposed environmental protection measures are implemented, the environmental effects of the proposed pump unit facilities would be insignificant or mitigable with known technology. In order to determine whether the environmental objectives have been achieved, the Board would condition any certificate to require IPL to submit to the Board results of the noise surveys to the Board.

## **6.5 New Tankage Facilities**

IPL indicated that the new tankage facilities would be constructed on fee simple properties owned by IPL where other tankage facilities currently exist. Vapour emissions would be mitigated by installing a floating roof and geodesic dome on each new tank. IPL indicated further that it would install a leak detection system under the proposed tankage, as well as a two level alarm system that would activate prior to any tankage overflow. To prevent adverse effects from spillage, tank lots would be lined with an impermeable liner, and be designed for a minimum retention capacity of 110 percent of the tank volume.



### *Views of the Board*

The Board is of the view that if IPL's proposed environmental protection measures are implemented, the environmental effects of the proposed tankage facilities would be insignificant or mitigable with known technology.

## **6.6 Socio-economic Matters**

IPL stated that recent studies of the socio-economic effect of pipeline construction on communities adjacent to the route have shown these effects to be generally positive. IPL indicated that its position is to encourage local employment and procurement. Where local vendors meet price, delivery and quality requirements in the tendering process, IPL stated that its policy is to select them preferentially. Moreover, contractors are encouraged to utilize the local work force and services and to purchase local supplies whenever practical. For the larger contract tender packages, IPL stated that it intends to ask bidders to identify specifically the expected local content, which IPL would then take into consideration in awarding contracts.

IPL noted that no potentially adverse socio-economic effects of its proposed project were raised during its public consultation program. IPL stated that it believes communities and municipal governments have a generally positive attitude toward the proposed project. While IPL recognized that there could nevertheless be some adverse effects, it indicated that these would not be significant. Once communities have been selected as the sites for temporary offices, IPL has undertaken to inform them of the expected size of the work force and the timing for a local office. This notification would be done prior to the commencement of construction, and again two weeks in advance of the occupation of an office. IPL also undertook to instruct all its contractors to follow all traffic regulations and local by-laws.

### *Views of the Board*

The Board is persuaded that any potential adverse socio-economic effects would be either insignificant or mitigable. The proposed project involves adding pipeline and facilities along an existing route where landowners and communities have experience with past pipeline construction and operations. The socio-economic issues raised by landowners and communities during the early public consultation process were resolved prior to the hearing. IPL has committed to remedial measures if required. The Board also notes IPL's commitment to promote positive local economic benefits.

## Chapter 7

# Financial Matters And Tolling Issues

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### 7.1 Financial Matters

IPL stated that it intends to finance the proposed expansion facilities through a combination of long term debt, internally generated funds or the issuance of treasury common shares.

None of the interested parties questioned the proposed method of financing.

#### *Views of the Board*

The Board has no concerns about IPL's ability to finance the proposed expansion.

### 7.2 Toll Methodology

IPL noted that the expanded facilities would serve the same markets as are currently served by its system. It further suggested that a rolled-in toll design would be appropriate for these expansion facilities, since any other toll design would result in different tolls being paid for the same service to the same destinations. This methodology is consistent with the currently approved toll design.

None of the interested parties questioned IPL's applied-for tolling methodology.

#### *Views of the Board*

The Board accepts IPL's evidence that the proposed toll methodology is consistent with the currently approved toll design and that any other methodology would result in different tolls being paid for the same service to the same destinations. Accordingly, the Board accepts IPL's applied-for tolling methodology.

### 7.3 Implications For 1994 Tolls

IPL presented evidence that the expansion project will result in an increase in the Edmonton to Sarnia light crude oil toll of approximately three cents per barrel in 1995, its first year of operation. IPL also indicated that there will be a one-time reduction in the Edmonton to Sarnia light crude toll of approximately six cents per barrel for 1994 only. This is the result of a reduction in the 1994 revenue requirement of approximately \$27.5 million, due to \$12.8 million of capitalized charges and \$14.7 million of additional income tax deductions available to the company as a result of the expansion.

CAPP expressed the view that upon approval of the expansion facilities, the 1994 tolls should be immediately adjusted so as to allow the full benefits of a reduction in the 1994 revenue requirement to flow to tollpayers.

### ***Views of the Board***

The Board notes CAPP's position regarding an adjustment to IPL's 1994 tolls should the proposed expansion be authorized, but is of the view that this matter is more properly dealt with in a separate proceeding.



## Chapter 8

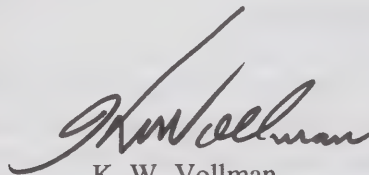
# Disposition

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The foregoing chapters constitute our Decisions and Reasons for Decision in respect of the application heard before the Board in the OH-1-93 proceeding. The Board finds that the supply of liquid hydrocarbons available to IPL will exceed currently available capacity through to 2001. Furthermore, the Board finds that the markets served by IPL can absorb additional volumes up to the levels of available supply, even in the event of an early reversal of the Sarnia to Montréal pipeline. The Board is satisfied that the evidence demonstrates a strong likelihood that the facilities will be used at a reasonable level and finds that the proposed facilities are required by the present and future public convenience and necessity. The Board is also of the view that the design and location of the facilities is satisfactory to ensure the safe and environmentally sound construction and operation of these facilities. Therefore, the Board will recommend to the Governor-in-Council that a certificate be issued. The certificate will be subject to the conditions outlined in Appendix II.

Upon issuance of a certificate, the Board will exempt the tankage and pump station facilities, pursuant to section 58 of the Act, from paragraphs 31(c) and 31(d), and sections 33 and 47 of the Act.

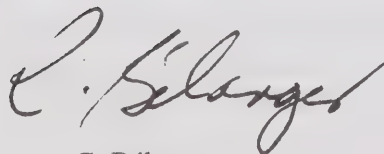
With regard to the Part IV determination concerning toll methodology, the Board finds that a rolled-in design would be appropriate for these expansion facilities.



K. W. Vollman  
Presiding Member



R. Priddle  
Member



C. Bélanger  
Member

Calgary, Alberta  
December 1993

## Appendix I

### Certificate Conditions

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1. The pipeline facilities in respect of which this certificate is issued shall be the property of and shall be operated by IPL.
2.
  - (a) IPL shall cause the approved facilities to be designed, manufactured, located, constructed and installed in accordance with those specifications, drawings and other information or data set forth in its application, or as otherwise adduced in evidence before the Board, except as varied in accordance with subsection (b) hereof.
  - (b) IPL shall cause no variation to be made to the specifications, drawings or other information or data referred to in subsection (a) without the prior approval of the Board.
3. Unless the Board otherwise directs, IPL shall implement or cause to be implemented all of the policies, practices, recommendations and procedures for the protection of the environment included in or referred to in its application, its environmental assessment and survey reports filed as part of its application, its "Environmental Standards and Guidelines for Pipeline and Facility Construction" (1993) and "Environmental Guidelines for Station Construction" (1993), its undertakings made to the Departments of Fisheries and Oceans and Environment Canada, or as otherwise adduced in evidence before the Board in the OH-1-93 proceedings.

#### Prior to Commencement of Construction

4. IPL shall, at least ten days prior to the commencement of construction of the approved facilities, file with the Board a detailed construction schedule or schedules identifying major construction activities and shall notify the Board of all modifications to the schedule or schedules as they occur.
5. Unless the Board otherwise directs, IPL shall, at least thirty days prior to the commencement of construction of the additional facilities, file with the Board, a copy of an Environmental Issues List prepared by IPL in accordance with paragraph 28(1)(a) of the Board's *Onshore Pipeline Regulations* and, if any additional issues arise during construction, file an updated Environmental Issues List in accordance with subsection 28(2) of the *Onshore Pipeline Regulations* and shall take appropriate action to resolve those issues.
6. Unless the Board otherwise directs, IPL shall file with the Board at least ten working days prior to the commencement of construction, the results of the following surveys referred to in the OH-1-93 proceeding:
  - (a) the heritage resources surveys, including the corresponding avoidance or mitigative measures;
  - (b) the detailed soil survey, including the identification of the locations where alternate soil handling procedures will be implemented; and

- (c) the special conservation status wildlife species surveys, including the methodology, dates and locations of the surveys and any corresponding avoidance or mitigative measures.
7. Unless the Board otherwise directs, IPL shall:
- (a) prior to the commencement of construction, file with the Board copies of all federal and provincial permits or authorizations which contain environmental conditions for the applied-for facilities; and
  - (b) during construction, maintain a file in the construction office(s) containing such permits and authorizations together with all permits subsequently obtained, which shall also be filed with the Board.
8. Unless the Board otherwise directs, IPL shall, prior to the commencement of construction:
- (a) serve the Heritage Resource Surveys on the Provinces of Alberta and Saskatchewan;
  - (b) seek the opinion of each provincial government described in paragraph (a) on the acceptability or non-acceptability of the Heritage Resource Survey and its recommendation(s);
  - (c) advise the Board of any recommendation(s) that IPL cannot accept arising from the survey reports or the provincial agencies, as well as IPL's rationale for not accepting those recommendation(s); and
  - (d) in the case of paragraph (c), advise the Board of the acceptance of all alternative mitigative measure(s) by the appropriate provincial agency.
9. Unless the Board otherwise directs, IPL shall submit to the Board prior to the commencement of construction, evidence that all outstanding concerns raised by Environment Canada have been resolved.
10. If a directionally drilled crossing of the South Saskatchewan River is to be undertaken, IPL shall file with the Board for approval thirty days prior to the commencement of construction activities for the river crossing portion, a plan for the crossing. This plan should include but not be limited to:
- (a) the final geotechnical report including a detailed assessment of related pipeline integrity concerns;
  - (b) a site plan indicating the location of the drilling equipment, pipe staging and other associated activities, including the amount of temporary workspace;
  - (c) a detailed work schedule identifying the major construction activities related to the directionally drilled crossing;
  - (d) a detailed description of the proposed guidance system for the pilot bore;



- (e) a detailed description of the type of drilling mud(s) to be used;
  - (f) a detailed description of any additives to be used with the drilling fluids;
  - (g) a detailed description of the drilling fluid containment and recirculating systems to be implemented during all phases of its handling;
  - (h) contingency plans to be implemented in the event of a loss of drilling fluid containment, including inadvertent returns of drilling fluid to the surface; and
  - (i) contingency plans to be implemented if noise or vibrations become a concern.
11. If a directionally drilled crossing of the South Saskatchewan River is to be undertaken, IPL shall file with the Board for approval thirty days prior to the commencement of construction activities for the river crossing portion, a plan for drilling mud disposal. This plan should include but not be limited to:
- (a) an estimate of the complete composition of the drilling waste including the relative quantities of water, bentonite and other sediments and drill cuttings, and any additives which may be necessary during construction or to allow for flocculation prior to disposal;
  - (b) documentation indicating that IPL has an agreement in place with a waste disposal facility to dispose of drilling waste solids in the event that land filling of solids is proposed;
  - (c) documentation indicating that IPL has the agreement of the landowner, where disposal on private land is proposed; and
  - (d) a discussion of the mitigation to be utilized for the proposed method of drilling mud disposal.

### **During Construction**

12. Unless the Board otherwise directs, IPL shall submit to the Board within five working days of the completion of the surveys, the results of the special conservation status vascular plants spring surveys referred to in the application, a description of the methodology, dates and locations of the surveys, and the corresponding avoidance or mitigative measures.
13. Unless the Board otherwise directs, IPL shall, during construction, ensure that specialized habitat for special conservation status wildlife and plants, and all raptors, will be avoided, relocated or restored in consultation with appropriate regulatory agencies.
14. If a directionally drilled crossing of the South Saskatchewan River is to be undertaken, IPL shall file with the Board, ten days prior to the disposal of any drilling waste, all information which was required of IPL to meet all relevant provincial requirements and guidelines.
15. If a directionally drilled crossing of the South Saskatchewan River is to be undertaken, IPL shall file with the Board, ten days prior to the first disposal of drilling wastes, and every two

weeks thereafter until the directional drill is completed, data analysis indicating the complete chemical composition of both the solid and liquid portions of the drilling waste to be disposed of, and plans for the necessary mitigation, specific to that chemical composition.

16. IPL shall, during construction, file with the Board monthly construction progress and cost reports, in a format to be determined through consultation with the Board, providing a breakdown, by location and facility, of costs incurred during that month, the percentage of each activity which has been completed and an update of costs to complete the project.
17. IPL shall, during construction, maintain for audit purposes at each construction site, a copy of the welding procedures and non-destructive testing procedures used on the project together with all supporting documentation.

### **Post Construction**

18. IPL shall, within six months of putting the additional facilities into service, file with the Board a report providing a breakdown of the costs incurred in the construction of the additional facilities, setting forth actual versus estimated costs, including reasons for significant differences from estimates.
19. Unless the Board otherwise directs, IPL shall, three months after the commencement of operation for the new or replacement pump units, file with the Board, a monitoring report for each affected station, which details the results of an appropriate monitoring program. This report should include, but not be limited to:
  - (a) the pre-construction and post-construction noise emission levels at the source, the station fence line, the IPL property line and the closest residence, while the pump units are at the maximum operating level; and
  - (b) any comments or complaints received as a result of pump unit operations, how they have been addressed and whether the complainant is now satisfied.
20.
  - (a) IPL shall file with the Board a post-construction environmental report within six months of the date that the last leave to open is granted for the additional pipeline facilities.
  - (b) The post-construction environmental report referred to in paragraph (a) shall set out the environmental issues that have arisen up to the date on which the report is filed and shall:
    - (i) indicate the issues resolved and those unresolved;
    - (ii) describe the measures IPL proposes to take in respect of the unresolved issues; and
    - (iii) provide details on the monitoring of the following items:
      - (A) the effectiveness of the reclamation program in areas of native pasture, including recommendations for future reclamation programs;



- (B) the locations of and reasons for, any alternate soil handling procedures implemented, and a discussion of the positive or negative effects of this activity;
  - (C) subsoil compaction and, topsoil loss and mixing, if wet soils conditions are encountered; and
  - (D) all special conservation status plant or wildlife habitat that are affected by construction activities, and all measures taken to replace this habitat.
- (c) IPL shall file with the Board, on or before the 31 December that follows each of the first two complete growing seasons after the post-construction environmental report referred to in paragraph (b) is filed:
- (i) a list of the environmental issues indicated as unresolved in the report and those that have arisen since the report was filed, including a summary of the extent to which an increase of surface stoniness is observed on disturbed agricultural lands; and
  - (ii) a description of the measures IPL proposes to take in respect of all unresolved environmental issues.
21. If a directionally drilled crossing of the South Saskatchewan River is to be undertaken, IPL shall submit to the Board within six months of the date that the last leave to open is granted for the additional pipeline facilities, a post-construction report which details any problems encountered during the directional drilling activities and solutions which were taken. This report should include, but not be limited to:
- (a) all problems (such as magnetic interference) which were encountered with the accuracy of the steering system;
  - (b) all problems encountered with pipe damage;
  - (c) all problems encountered with muds exiting to the surface through unconsolidated beds or through abandoned pilot holes;
  - (d) all social concerns raised during the course of the drilling activities;
  - (e) problems encountered with drilling mud containment or disposal; and
  - (f) the level of noise and vibration caused by the directional drilling activities to the surrounding environment.

### **Expiration of Certificate**

22. Unless the Board otherwise directs prior to 31 December 1995, this certificate shall expire on 31 December 1995 unless the construction and installation of each of the additional facilities has commenced by that date.





